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CHANGE OF TELEPHONE NUMBER.—The telephone number of THE RAILWAY GAZETTE *is now Whitehall* 9233

Six Months' Passenger Train Traffics

FOLLOWING the usual practice, the Ministry of Transport statistics for the month of June, 1935, include an analysis of passenger train traffics for the first half of the year of the standard-gauge railways of Great Britain, apart from London Transport railways and the Whitechapel & Bow Joint Railway. Passenger journeys of all descriptions increased except in the case of standard-fare passengers, who numbered 42,247,123, a decrease of 970,584, or 2·25 per cent. Standard fares brought in £3,014,633, a decrease of £189,332, or 5·91 per cent. Monthly return and period excursions continued to grow in numbers but only to the extent of 1·89 per cent., as they compare with a period in 1934 when there was a 97·84 per cent. improvement on 1933. Receipts from these tickets were £6,804,144, a decrease of £18,155 or 0·27 per cent. Day, half-day, and evening excursion tickets increased by 4·14 per cent., and the receipts therefrom (£6,425,419) by £311,384, or 5·09 per cent. Total receipts from passengers were £20,099,974, an increase of £571,358, or 2·93 per cent. Seasons, at £4,117,415, brought in £20,414 more, and the revenue of £6,288,662 from parcels, &c., was £6,715 higher. The reduction in the scales of first class monthly, tourist, and excursion tickets appears to have justified itself, as with a much higher proportionate increase in numbers, first class receipts (apart from season tickets) of the four group companies for the six months amounted to £1,557,589, an increase of £43,844, or 2·89 per cent. For individual companies the respective figures were:—

	£	£
L.M.S.R.	523,404	+ 9,516
L.N.E.R.	376,182	+ 13,857
G.W.R.	215,056	+ 12,497
S.R.	442,947	+ 7,974

First class season ticket receipts were generally down, except that the Southern figure of £275,465 represents a net increase of £10,226.

* * * *

The Railways of Iraq

The conversations which have been proceeding for some years between the British and Iraqi authorities as to the ultimate fate of the Iraq Railways have now reached a stage, we learn officially, when general agreement in principle has been reached for the transfer of ownership to the Iraqi Government. Apart from the sections of the German Baghdad Railway which were completed up to the war period, the railways were built by the British Forces, mainly consisting of the Indian Labour Corps, during the war and shortly after the armistice, since when they have been altered and improved to suit commercial conditions. Although we understand that many details still remain to be settled, the broad outline of the proposed transfer is stated in a message from Baghdad to include the payment by the Iraqi Government of £400,000 to Great Britain. This sum will include machinery, stores, and land valued at £315,000. A limited number of British technical officials would be retained for a short period if their services were needed. The future administration of the railways would be carried out by a board of management, the majority of the members of which would be Iraqis. If schemes which have been recorded in our columns recently are completed, it seems probable that the railways of Iraq will assume added importance by being linked up with the main Turkish and Syrian railways, but this will raise break of gauge difficulties as the standard 4 ft. 8½ in. gauge adopted by the Germans was necessarily abandoned during war years so as to use readily available metre gauge equipment from India. At present some 998 km. are of this gauge and only 213 are standard.

* * * *

The Week's Traffics

In the traffics of the four group companies for the past week the most noticeable feature is a general advance in coal class receipts, which have for some time been depressed except on the L.M.S.R. Another point to be mentioned is an increase in the general merchandise take of the Southern. For the corresponding week in 1934 gains were recorded in passenger train and merchandise receipts by each of the four companies, but coal receipts were down except for a gain of £8,000 on the L.N.E.R. Aggregate gross receipts of the four companies for the 40 weeks of 1935 amount to £116,336,000, an increase of £754,000, or 0·65 per cent. Passenger train traffics to date have reached £53,840,000, which means an advance of £1,172,000, or 2·23 per cent. Aggregate merchandise earnings, however, show a net decrease of £55,000.

	40th Week				Year to date.	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R.	+ 9,000	+ 14,000	+ 14,000	+ 37,000	+ 530,000	+ 1·15
L.N.E.R.	+ 13,000	− 3,000	+ 8,000	+ 18,000	− 16,000	+ 0·05
G.W.R.	+ 10,000	—	+ 2,000	+ 12,000	+ 103,000	+ 0·53
S.R.	+ 11,000	+ 1,500	+ 4,500	+ 17,000	+ 137,000	+ 0·87

The "Pullman Tradition"

A change in locomotive working on the L.N.E.R. occasioned by the Silver Jubilee service brings to an end one of the most celebrated links in railway history, for King's Cross shed will no longer be responsible for working the Pullman trains. From the earliest days of this service, the link established a wonderful reputation for punctual running, while the accelerations of May, 1932, which brought Leeds within 3¼ hours of King's Cross, merely spurred the drivers to still finer efforts. During the past three years, it has been no uncommon occurrence for 10 or even 15 minutes of lost time to be regained, and when the older men retired, or were promoted, younger hands took the regulator with equal keenness. One of the latest recruits was recently responsible for making up 17 minutes of lost time with the Queen of Scots. The "Pullman tradition" has been well and truly established by which drivers would seem to make it a point of honour to arrive on time, if humanly possible. Some of the enginemen who have helped to build up this tradition are continuing the good work on still more arduous duties, and it is not without significance that the two greatest speed exploits which this country has yet seen stand to the credit of one-time Pullman men—first, Driver Sparshatt's 108 m.p.h. with the Super-Pacific *Papyrus*, and now Driver A. J. Taylor's astounding run with the streamlined *Silver Link*. It is fitting that the end of King's Cross shed's association with the Pullman trains should be signalised by such a feat.

* * * *

Overseas Railway Traffics

In the matter of gross earnings the Canadian Pacific has by its last week's increase of £276,000 secured an advance of £228,000 for the 39 weeks of the current year, but in net earnings the decrease of £508,200 recorded up to the end of August has still to be accounted for. For the past week the Argentine exchange averaged 17·02 pesos to the £ against 17·03 for the week before, and the comparisons were with 17·09 and 17·13 respectively for the corresponding weeks of 1934-35. The best Argentine traffic increase during the past fortnight has been the £14,553 of the Central Argentine, followed by the Buenos Ayres & Pacific increase of £12,656. Other Argentine traffic gains in the same period have been more moderate, as that of the Buenos Ayres Great Southern is only £4,493 and that of the Western only £925. With its improvement of £5,600 during the past fortnight, the Cordoba Central is now £4,270 to the good on the year to date.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£		£	
Buenos Ayres & Pacific	14th	74,031	+ 5,628	1,008,914	+ 35,087
Buenos Ayres Great Southern	14th	113,925	+ 1,286	1,670,583	— 42,006
Buenos Ayres Western	14th	38,367	+ 333	559,610	— 17,810
Central Argentine	14th	117,729	+ 7,182	1,659,906	— 80,376
Canadian Pacific	39th	962,200	+ 276,000	18,408,000	+ 228,000
Bombay, Baroda & Central India	26th	201,900	+ 10,575	3,804,375	— 45,675

* * * *

A London Spectacle

The departures of the Silver Jubilee from King's Cross qualify to rank with the established sights of the capital, for the crowds that congregate on No. 6 platform as much as half an hour before 5.30 p.m. represent that range of ages, types, and interest that characterise spectators of the older London institutions. All the ingredients of spectacle are there, from the military smartness of the train attendants to the growing tension as half past five approaches. Nature has added to the pleasure of the beholders by providing a twilight which emphasises the glow of the fire in the engine cab, and a darkening sky against which the tall and spreading column of *Silver Link's* exhaust stands out with startling whiteness and solidity. Like most London crowds, this one makes no great display of its feelings, contenting itself with a little desultory hand-waving and a communal sigh of satisfaction as the last coach vanishes into the tunnel. But the symbolism of speed and distance epitomised in this little nightly pageant, staged at the moment when its spectators have just earned a few hours' freedom from the circumscribed atmosphere of office or factory, must surely react to the benefit of the railways as a whole by awakening a wider consciousness of how travel can relieve the uniformity of life.

* * * *

Lee-on-the-Solent Railway

This railway of 3 miles in length from Fort Brockhurst (Gosport) to Lee-on-the-Solent, which had been closed to passenger traffic since December 31, 1930, was closed to all traffic on Sunday, September 29. The Lee-on-the-Solent Railway Company was incorporated on July 5, 1890, by a certificate of the Board of Trade under the Railways Construction Facilities Act, 1864. It was opened on May 12, 1894, and was worked as an independent undertaking until August 1, 1909, when its working was taken over by the London & South Western Railway under an agreement scheduled to that company's Act of 1909. This agreement provided that any excess of gross receipts over £1,400 a year should be divided in the proportions of 75 per cent. to the Lee-on-the-Solent Company and 25 per cent. to the working company. Its receipts never reached £1,400 in any year, and it never paid a dividend on its ordinary share capital of £30,000 in 3,000 of £10 each. There were also loans outstanding of £2,500 at 4 per cent. During the years when it was an independent concern expenses always exceeded receipts, and in 1908, the last full year of independent working, receipts were £712 and expenditure £1,502. By the end of 1922 the debit balance forward had grown to £13,761, and the accrued liabilities had reached £14,597.

* * * *

A Test Case for Absorption

Under the grouping scheme of the Railways Act, 1921, the Lee-on-the-Solent Railway came to be absorbed in the undertaking of the Southern Railway. Though it was such a small railway the terms on which it was to be absorbed set a precedent for the acquisition of other insolvent undertakings. When the matter came before the Railway Amalgamation Tribunal in 1923 the Southern Railway contended that the line had no value. The land was leased from the War Office, which had the right to remove the railway without compensation, and there were outstanding liabilities of over £14,000, which, as the Lee-on-the-Solent Company was insolvent, could not be met. It was argued for the Southern Railway that it was not incumbent on the tribunal under the Act to transfer these liabilities on absorption. The tribunal, however, felt itself bound by Section 5 (a) of the Act, read in connection with the Railways Clauses Act, 1863, to hold that all liabilities must be transferred on absorption, though recognising that in certain cases, this might create a situation which was not in fact equitable. A case was stated for the opinion of the Court of Appeal, which confirmed the decision of the tribunal on the point of law, and it was eventually agreed to carry the matter no further. The absorption scheme (S.R. & O., 1923, No. 1,045) was settled by the tribunal on August 11, 1923, vesting the line in the Southern Railway as from January 1, 1923.

Norwegian Railway Enterprise

More new railway construction is going on at the present time in Norway, probably, than in any other country of Western Europe, and details of the various projects that are now in course of execution are set out on page 594 of this issue. They form part of a comprehensive plan that has been drawn up by the Norwegian Storting for the relief of unemployment, and apart from the engineering difficulties involved in building railways through a *terrain* of such exceptionally mountainous characteristics, these projects show commendable faith in the future of railways. Most important of all the schemes, probably, is the Sörland Railway, designed to link Arendal, Kristiansand, and Stavanger with Oslo, and ultimately, in all probability, to provide, in conjunction with the B. & N. motorships, a through traffic artery between England and Oslo, tapping the most populous part of Southern Norway. In the north, the Nordland Railway is being carried on from Grong for 116 miles to Mosjöen, with the later intention of reaching Bodö, within the Arctic Circle. Widening from 3 ft. 6 in. to standard gauge of 87½ miles of the original Oslo-Skien main line, through Tönsberg and Larvik, is also in progress; doubling the Kornsjö main line for 10 miles from Ljan to Ski; and electrification through the Oslo suburbs for 15 miles from Oslo to Ski, as well as for 61½ miles from Kongsberg to Hjuksebö and Borgestad, and Hjuksebö to Notodden, all form part of this great Norwegian railway improvement scheme.

* * * *

Modern Methods in Bridge Rebuilding

The constant demand for increased train loads and correspondingly more powerful and heavier locomotives continues to exercise the ingenuity of the engineer in the rebuilding of bridges under traffic. This rebuilding has, for the most part, been completed on British main lines, at any rate for the moment, and attention is being devoted to improving the standard of secondary lines in this respect. A noteworthy example of the latest practice in reconstruction is the bridge over the Avon on the Mangotsfield-Bath branch of the L.M.S.R.; consisting of two spans each of 106 ft., on a 45-deg. skew. The old bridge consisted of four face girders and two centre girders of the lattice type carried on stone-faced abutments and a pier comprising ten cast iron screw columns. The latter were burnt into sections for removal prior to replacement by a concrete pier. The new girders are of the plate variety, 115 ft. in length, 9 ft. in depth, and weighing 82 tons (centre girders) and 52 tons (face girders). The launching of these heavy girders beyond the first 45 ft., was assisted by a cantilever arm built out from a special ballasted wagon. Single line working was enforced, and the wagon ran on the disused track, the cantilever, which took hold of the end of the new girder, being supported by a roller running on a rail fixed along the top of the adjacent old girder. The old lattice girders and also their cross girders were burnt into sections to facilitate dismantling and removal. Illustrations of this work appear on page 597.

* * * *

Overseas Mechanical Workshops

In carrying on the tradition of our constituent *The Railway Engineer*, we publish, on pages 587 *et seq.*, the first instalment of a serial article descriptive of a typical example of Colonial or Overseas mechanical workshops. The first point in it to which we would draw attention is the fact that, with the exception of the Workshop Superintendent, his two assistants and a small number of foremen and their assistants, the personnel employed consists entirely of Africans, including chargemen, inspectors, and artisans. Most of these Africans have been trained locally in the technical school adjoining the works, to provide the theoretical knowledge necessary to supplement the practical experience gained as apprentices. This is a normal method of training Overseas, but, where facilities are available, the apprentices and junior hands sometimes go on to study at a university college, and take local degrees in engineering. Another point to notice in the article, though this does not transpire in Part I, is the very great preponderance of British-built machines installed in Ebute Metta shops. Every variety of tool, and a wide range of manufacturers are represented.

* * * *

High-Speed Auxiliary Locomotive Performance

Tests extending over twelve months have been made on the Lehigh Valley Railway, America, with a high-speed auxiliary engine taking the form of a six-coupled unit or motor bogie located at the rear of the large twelve-wheel tender of a 4-8-4 fast freight locomotive. This auxiliary engine has two 12¼ in. × 11 in. cylinders driving, through gearing, the front pair of wheels. The additional drawbar pull developed by the unit used with this locomotive increases the starting power of the locomotive by 28·2 per cent., but the figure falls to 7·7 per cent. at 30 m.p.h., presumably the highest speed at which the unit would be worked. During the first series of tests, all in regular service, the auxiliary engine covered 26,600 miles and gave satisfactory performance both in respect of operation and maintenance. The tyres on the geared axle were renewed before the second series of trials was undertaken and have since covered 40,000 miles, but those on the other wheels covered 65,000 miles without re-turning. Although flange wear was beginning to develop, all tyres were considered good for another 15,000 miles before turning. This performance was attributed primarily to the reduction in unsprung weight on the axle of this design and to the fact that the tyres were heat-treated. After 65,000 miles of service the side-rod bushings did not require replacement on account of wear, and the connecting rods and bushings, crossheads and guides, were found to be in good condition: the valve motion showed no wear. The results were considered additionally significant in view of the unusually severe service to which the machine was continuously subjected, including long runs with very heavy trains at comparatively low speed, and other runs involving speeds up to 70 m.p.h.

* * * *

‘ Obsolete ” Locomotives

To the question “ when is a locomotive obsolete? ” the reply in some cases at least would be, “ when it can no longer perform any kind of useful work.” That view is by no means universally held, nor can it be defended on economic grounds. In America, especially, the tendency is often to classify engines built only a few years back as obsolete, and we have in mind a particular case in which a large 2-8-2 series built as recently as 1929 is considered out-of-date because—owing to the small diameter of the coupled wheels—it is now found unsuitable for high speed service. It is not, therefore, only because of physical age that an otherwise useful type of locomotive may quickly find itself relegated to a category other than that for which it was originally built. The characteristics of the present day locomotive, built to meet modern requirements in their most advanced form, were summed up by a prominent locomotive building firm in the United States as follow: big boiler, large coupled wheels, great hauling capacity at speed, economy in fuel and water, and low repair costs. This savours of an epitome of all the virtues in a unit.

XUM

Central Argentine Railway

IF only operating results had to be considered the position of the Central Argentine Railway for the financial year ended June 30 last might well have been regarded as encouraging in spite of the continuing menace of unregulated road competition. Both in general passenger and goods traffic there was an appreciable improvement, and the total gross receipts of £9,865,160 showed a decrease of only £5,704, or 0·1 per cent., which would have been turned into a substantial increase, but for a fall of £545,016, or 59·2 per cent., in Government traffic collections. In the working expenses of £7,158,446 there was a reduction of £52,516, or 0·7 per cent., so that the net receipts of £2,706,714 showed an improvement of £46,812, or 1·8 per cent. All this advantage was, however, swept away by the exchange differences of £1,228,623, which cost £223,804 more than in the previous year. To the balance of £1,478,091 is added £33,592 income from investments, and payments of £1,336,321 for debenture stock interest, &c., are covered, leaving a balance on net revenue account of £175,362. This balance and the £498,385 brought forward from the previous year are to be carried forward. During the year £707,540 of 5 per cent. redeemable debenture stock 1967/87 were sold and the proceeds applied in reduction of the amount overspent on capital account.

After so long a sequence of decreases, the advance of £147,977, or 6·8 per cent., in passenger receipts was particularly gratifying. The heavier excursion traffic brought in an additional £131,792 from both first and second class passengers, and of this addition about £47,000 was due to the Eucharistic Congress in Buenos Aires. In the suburban area also the electrified services with the aid of reduced fares held their own in the face of keener motor transport competition. Public goods traffic increased by 1·9 per cent. in tonnage and by 6 per cent. in receipts. The average haul was longer and there were increased despatches of most of the higher-rated commodities. Only two classes of freight showed up less favourably than in the previous year, namely wheat, which had a decrease of 691,056, or 35·8 per cent., in tonnage, and of £524,726, or 38·2 per cent., in receipts, and sugar and cane, which brought in £11,973, or 7·1 per cent., less. Maize carryings produced an increase of £312,997, or 23·4 per cent., with a longer average haul, chiefly due to the large surplus of old maize on hand which was transported in the early months of the financial year. The bountiful maize crop which arrived in March was, however, largely withheld from transport owing to the producers' reluctance to market their holdings at ruling prices. There was an encouraging expansion of £141,158, or 17·6 per cent., under general merchandise, which, being a particularly lucrative, long-haul traffic, produced—after maize—the largest advance in freight earnings. For traffics threatened by road competition further special rates were introduced. Some operating results are compared in the accompanying table:—

	1934–35	1933–34
Average miles open	3,700	3,700
Number of passengers.. ..	43,065,481	41,672,455
Passenger receipts	£2,338,936	£2,190,973
Public goods traffic (tons) ..	7,481,657	7,338,901
,, ,, ,, (receipts)	£6,117,908	£5,770,370
Average receipts per ton of goods	16s. 4¼d.	15s. 8¾d.
Public traffic train-miles ..	12,951,214	12,278,991
Net profit per train-mile ..	4s. 2¼d.	4s. 4d.
Net profit per mile of line ..	£731 10s. 10¾d.	£718 17s. 10¼d.
Operating ratio, per cent. ..	72·56	73·05

The continued development of motor transport in and around Buenos Aires was countered by a new expansion of suburban train working, to which the travelling public has responded. On the main line also, the additional services have been well supported. The increase of 377,450, or 10·4 per cent., in goods and live stock train-miles has been justified by an improvement of over 13 per cent. in freight ton-mileage, resulting in a higher average paying load per train. The saving of £52,516 in expenditure was the result of the reduction of the renewals contribution from £600,000 to £314,096; direct outgoings were £233,388 greater, due to an advance of £149,837 in wages, and an extra £83,551 on materials, fuels, &c. The increase in wages was entirely due to the suspension of the previous cut as from the beginning of October, 1934. Under "way, works, and stations" expenditure was lower, as the larger outlay on materials was counteracted by a reduction in the strength of permanent way gangs, facilitated to some extent by the greater use of labour-aiding equipment. Actual operating expenses were £43,976, or 1·1 per cent. higher, mainly due to heavier traffics and the suspension of the wage cut. The General Manager estimates that wages represent about 73 per cent. of the total outgoings. Among the miscellaneous works carried out during the year were the superheating of two locomotives and the reconversion of eight passenger locomotives from oil to coal burning.

* * * *

The Cairo-Suez Direct Line

EGYPT has for long been famous as a country of transit between Europe and the Far East. As long ago as 1835 there was a regular fortnightly service between Alexandria and Suez via Cairo for the carriage of passengers and mails. Passengers disembarking at Alexandria assembled in houseboats which were towed by the Peninsular & Oriental Steam Navigation Company's tugs on the Mahmudia canal to Atf, where they transhipped into P. & O. Nile steamers which took from 16 to 20 hr. to reach Cairo. From Cairo, heavy luggage was despatched by camel to Suez while passengers proceeded by coach, which took about 20 hr. to reach Suez. The P. & O. steamer for Calcutta left Suez about 20 days after the departure of that from Southampton, and the whole trip to Calcutta was reduced from four months to six weeks, four months being the time taken by the all-sea route round the Cape of Good Hope prior to the opening of the Suez Canal in 1869. It was largely due to the energy and resource of the late Lt. Thomas Waghorn, R.N., that this route through Egypt was established, a route which continued to function until the first railways in Egypt were laid.

The first section of line between Alexandria and Kafr-el-Zayat was opened in 1854. It was constructed by Robert Stephenson, son of George Stephenson, and was extended to Tanta in 1855 and to Cairo in 1856. The line from Cairo to Suez followed the coach road across the desert and was completed in 1858. There were two intermediate stations on this line, one at El Ribeiqi and the other at Gebel Iweibid. Garrisons were stationed at these places, and in our illustration of Gebel Iweibid station may be seen the trough into which water tanks discharged in order to fill the underground reservoir which supplied the garrison with water. This railway provided a link in the chain of communication between Europe and the Far East from 1858 until the opening of the Suez canal in 1869, when the direct line from Cairo to Suez was taken up, and rail communication with Suez was provided from Ismailia. In 1930 it was decided to reconstruct the old line with a view to developing Suez as a summer resort, and the work, which is now completed, is briefly described and illustrated on pages 592-3. A feature of interest is that passenger services are to be maintained by diesel railcars.

Slip Coach Services

THE verb " to slip," in its railway application, is considerably younger than the practice of slipping itself, a fact which has hitherto rendered the early history of slip coaches somewhat obscure. There is some ambiguity in the phrase " carriages detached," so that although it had appeared in timetables prior to December, 1858, the Great Western slips at Slough and Banbury off down Birmingham expresses introduced in that month and year have been widely regarded as the earliest authenticated examples of such workings in this country. It would be appropriate if this tradition could be confirmed in the centenary year of a company which has always been a consistent and prolific exponent of slip carriages, but the files of one of our own constituent journals definitely allot priority elsewhere (although by a small margin). On December 11, 1858, *Herapath's Railway and Commercial Journal* published a somewhat scathing leading article on " Railway Novelties." The practice of picking up and dropping mails at speed was among the targets of our predecessor's ridicule, but its principal butt was a Monsieur Guichard Pétrus who claimed to have invented a system for attaching coaches to moving trains. Having effectively withered M. Pétrus, the author acknowledged that a means of effecting the reverse operation had already been accomplished, describing it in the following terms:—

> A plan of dropping passenger carriages without pulling up the train or lessening its speed has been practised all the summer on the Brighton Railway. It is done by having a detent at one extremity of the draw bolt chain, with a rope attached thereto, and passed to the guard at the head of the part of the train to be left. About half a mile or so before the train reaches the station at which the carriages are to be left, the guard pulls the rope, draws up the detent, and releases the carriages, which, by their impetus, run up to the station, and are there stopped by the brake, the other fore part of the train having gained some distance in advance.
>
> This contrivance is of course chiefly applicable to parts of a train attached behind the principal train, and intended to go to another road where the line branches off as at Haywards Heath on the Brighton Railway. It might be made to drop a single carriage or so at the end of a train at any station, but it would not be worth the extra expense of an extra van and guard.

It will be noticed that *Herapath's* disposition to scout the novel and untried led him in his concluding observations to prophesy a reason which has had much to do with the decline of slip coach services since the war.

The Brighton Railway timetables show that the Haywards Heath slip above referred to was introduced in February, 1858, and that the carriage gave a through service to Lewes off the 4.0 p.m. from London Bridge to Brighton. A few months later, in May, the phrase " carriages detached " appeared in the South Eastern Railway timetables in connection with certain arrivals at Canterbury and Sturry. Advertisements in *The Kentish Gazette* and *The Kent Herald* of the same period for the Canterbury service leave no doubt that it meant a slip coach, and not the mere removal of certain carriages during the stop. They read: " 1st class from London to Ramsgate and Margate, 1st and second class to Canterbury where the carriages are detached; the train does not call there." The train concerned was the 12.30 p.m. from London Bridge. In July, 1860, the same somewhat cumbersome description of slipping appeared in a *Bradshaw* note to the arrival times at Sturry and Minster of the 2.30 p.m. ex-Canterbury. Possibly the idea of being " slipped " was considered incompatible with Victorian dignity, for every effort seems to have been made to skirt round it. In October, 1864, for example, passengers for Retford by one train from King's Cross were warned to get into the last carriage; had the Great Northern authorities been a little more outspoken the historian would feel more pleasure in hailing them as the next, and the first of the northern lines, to adopt the system. Slipping on the Great Northern developed until, in 1885, the company operated twenty-seven slips against the Great Western's twenty-six, and this was after reaching a peak of thirty in 1883. The highest G.W.R. total was 79 in 1908.

Subsequent dates on which slip coaches were inaugurated are shown in the table herewith. Before leaving the subject as it concerns this country, certain features of such services call for notice. A disadvantage on long journeys was that passengers in slip coaches were deprived of access to the restaurant car. Both the L.N.W.R. (to serve Coventry off Birmingham 2-hr. trains) and the Midland Railways introduced vestibuled slips before the war to overcome this objection. The Great Western Railway adopted a different solution by actually including a restaurant car among the slip coaches for Ilfracombe on the 11.50 a.m. West of England express. The same company also performed the unusual feat of slipping at two consecutive stations—Hatton and Warwick—from an express to Birmingham. As recently as 1921 slip coaches of the G.W.R. were experimentally fitted with acetate of soda storage heaters, but an adaptor was later introduced which allowed the slip to take its heat from the train system. Whatever regret may be felt at Paddington that the

Railway	Slips Commenced	Slips Given Up	No. of Places	Greatest Number in a Year	Totals										Still Left
					1875	1880	1885	1890	1895	1900	1908	1914	1918	1924	1934
Total ..	—	—	—	—	58	88	92	122	127	129	178	200	17	93	29
G.W. & L.N.W. Jt.	1868	1894	1	2 in 1880 ..	—	2	2	1	—	—	—	—	—	—	—
G.W.R. ..	Dec., 1858	—	43	79 in 1908 ..	25	32	26	30	42	49	79	72	—	47	23
S.E.R. ..	July, 1860	July, 1924 ..	11	11 in 1863–65	4	3	4	3	3	1	2	3	—	3	—
L.C.D.R. ..	Dec., 1872	July, 1926 ..	6	5 in 1896, &c.	3	3	3	4	3	4	3	6	—	7	—
L.B.S.C. ..	Summer, 1858	Apr., 1932 ..	11	27 in 1914 ..	3	7	8	9	9	9	14	27	2	21	—
L.S.W.R. ..	March, 1887	May, 1902 ..	—	4 in 1896, &c.	—	—	—	2	3	4	—	—	—	—	—
L.N.W.R. ..	March, 1869	Dec., 1916 ..	11	18 in 1914–15 (+1 newspaper)	2	1	1	1	—	9	16	18	—	—	—
M.R. ..	July, 1886	Dec., 1916 ..	26	25 in 1888 ..	—	—	—	19	17	5	13	21	—	—	—
Furness Rly.	July, 1887	Dec., 1916 ..	5	7 in 1891 ..	—	—	—	4	5	3	2	1	—	—	—
L.Y.R. ..	Oct., 1886	Oct., 1926 ..	7	8 in 1899, &c.	—	—	—	5	6	8	7	7	5	6	—
Caledonian	Jan., 1904	Dec., 1916 ..	9	14 in 1911 ..	—	—	—	—	—	—	12	12	—	—	—
G.S.W.R. ..	June, 1898	Sep., 1901 ..	1	1 in 1899, &c.	—	—	—	—	—	1	—	—	—	—	—
G.N.R. ..	Oct., 1864	Dec., 1916 ..	12	30 in 1883 ..	15	27	27	17	9	6	1	1	—	—	—
G.E.R. ..	June, 1872	—	15	25 in 1904 ..	2	9	17	18	20	23	16	18	—	3	2*
M.S.L.–G.C.	May, 1886	—	11	11 in 1894 ..	—	—	—	6	7	1	2	4	—	2	2
N.E.R. ..	Jan., 1871	1905	3	3	1	1	1	1	1	1	—	—	—	—	—
N.B.R. ..	May, 1870	May, 1894 ..	5	3	3	3	3	2	—	—	—	—	—	—	—
Eskdale ..	July, 1921	1924	1	1	—	—	—	—	—	—	—	—	—	—	—
G.S.W.R. ..	June, 1901	—	7	8	—	—	—	—	—	—	8	8	7	—	1
M.G.W.R.	1909 ..	July, 1928 ..	1	2	—	—	—	—	—	—	—	1	2	1	—
B. & N.C. (N.C.C.)	July, 1895	Sep., 1916 ..	4	4	—	—	—	—	2	2	1	1	—	—	—
G.N. (I.) ..	August, 1896	—	7	3	—	—	—	—	—	3	2	—	1	2	1†
B. & C.D. ..	Nov., 1902	Apr., 1918 ..	1	1	—	—	—	—	—	—	1‡	1‡	1‡	—	—

* 1 in Summer † In Summer ‡ Saturday

distinction of being the first to slip has passed south of the Thames, there can at least be satisfaction at the thoroughness with which the system was developed. Moreover, the Great Western is the only one of the three pioneers of 1858 to be operating slip coaches today. Authenticated slips on the other side of the Channel are extremely rare. The 1889 edition of Acworth's "Railways of England" mentions one at Le Pecq on the Western Railway of France off the 5.10 p.m. train from Paris (St. Lazare). The same system (now the French State Railways) revived the practice as recently as the summer of 1933 in connection with a Saturdays only non-stop express from Paris to Le Havre. The slip portions were dropped at Motteville for Fécamp and Etretat, and at Bréauté-Beuzeville for Saint-Valery-en-Caux. Approximately contemporaneous with the first French slip was one in Holland which made its appearance on the Dutch Rhenish Railway in October, 1886. The train concerned was a non-stop express from Amsterdam to Rotterdam *via* Gouda, which slipped a carriage at Woerden for The Hague. Thereby a Dutch railway tradition that no train should completely ignore the royal residence was maintained, only to be broken in the same month by the rival Holland Railway route, which launched a competitive non-stop, and non-slipping, service.

* * * *

A Buffer Stop Collision

CONSIDERING the large number of terminal stations there are in this country, the cases reported of collisions between trains and buffer stops, or with vehicles standing at buffer stops, are comparatively rare. These reports are officially divided into two classes, arising (*a*) from trains running into stations or sidings at too high a speed, and (*b*) from other causes. The annual accident reports show that during the five years 1930-1934 inclusive, there were only 12 of class (*a*) and 185 of class (*b*). More significant still is the fact that of these 197 buffer stop collisions, only seven were considered of sufficient importance to demand a formal inquiry by the inspecting officers. All these seven reports, except one, required no further comment from us than could be contained in an editorial note; the exception was the case at Victoria on April 25, 1933, in which the brake power of electrically operated trains was involved. Now, however, we find it advisable to make more lengthy observations on the report by Major Wilson on the accident at Gourock on Sunday, June 16, which is summarised on page 604 herein.

The more serious question herein raised concerns the driver's lack of knowledge of the conditions governing the running of a passenger train into Gourock station. The man was on a mineral train link, and worked into Gourock only on Sundays and at excursion times, and had not been there during the previous twelve months. Further, he had only once been into the platform line in question, and that was more than a year ago. His route-card had the Gourock line struck out in red ink, which signified that he was not competent to work into that terminus, and that he should not have been booked for that duty. Major Wilson thereon remarks that the supervision of the rostering at Polmadie shed, in relation to knowledge of routes, was not altogether satisfactory. The railway company is now taking action to rectify this. There is a speed restriction of 10 m.p.h. when passing No. 2 signal-box, 452 yd. from the buffer stops, but Major Wilson himself observed that a speed of 15 to 20 m.p.h. for arriving trains was quite normal, and he considers that this lack of strict observance of the regulations detracts from its value as a safeguard. The fitting of a combined speed indicator and recorder, so often advocated by us, would have insured the observance of this speed restriction. The guard of the train, though a man of long experience, who had lately and frequently worked into Gourock, was not sufficiently alert, or he would have noticed that the speed was higher than usual and applied the continuous brake, probably in sufficient time to avert the collision. He did not, in fact, give the driver the assistance to which he was entitled when entering a somewhat difficult terminal platform.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The World's Greatest Speed Record !

17, Worsley Road, N.W.3.
October 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Why all this fuss about the Silver Jubilee? A reference to page 968-9 of the October issue of Bradshaw reveals a timing by the same railway which makes the Silver Jubilee's performance appear positively pedestrian. The train in question also departs from Newcastle, leaving at 11.25 a.m. and reaches Hexham, 20¾ miles, at 11.33, a start to stop run of 155 m.p.h., which is, and seems likely to remain, the world record. The next section of the run, to Carlisle, 39½ miles, is booked at a comparative amble in 22 minutes.

It is most remarkable that the L.N.E.R. should have remained silent concerning a train covering 60 miles of difficult road, with an intermediate stop, in 30 minutes. Dare I cast a doubt on Bradshaw's accuracy?

I am, Sir,
Yours faithfully,
M. D. GREVILLE

Tail Lamps

River Road, Bhusaval,
Bombay Presidency, India.
September 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In connection with your editorial on the above subject in your issue of July 26, it may interest your readers to know that, whilst electric side lamps have been standard throughout most railways in India, and have proved eminently satisfactory, tail lamps are still of the oil burning type. The reason for this is that they are so often required on rearmost vehicles which are not electrically fitted.

Arrangements are in hand, insofar as the Great Indian Peninsula Railway is concerned, for the building up of tail lamps of a combined electric and oil type, so as it can be used in conjunction with Kent couplings on electrically fitted stock and also as an oil-burning lamp on other stock.

The tail lamp in India being the indication of the last vehicle by day as well as night, there is objection to fixed electrically fitted tail lamps, in that, when not the rearmost vehicle, and carrying the sign of such, the marking of the rearmost vehicle in consequence loses its worth.

Yours faithfully,
R. HORSFRIED

THROUGH BOOKINGS IN LONDON.—On and from October 1 there has been a curtailment of through tube, bus, and tram tickets for London Transport services. In many cases there has been little demand for these facilities; however, in every case tickets will still be available to the more popular centres. Among the terminal stations affected by the change are Hammersmith, Manor House, Ealing Common or Ealing Broadway, Golders Green, Hendon, Highgate, Morden, Kilburn Park, Putney Bridge and Enfield West.

PUBLICATIONS RECEIVED

A Supplementary Study of the Locomotive Front-End. Bulletin No. 274 of the University of Illinois Engineering Experiment Station. 40 pp. 9 in. by 6 in. Price 50 cents.—Since the classic experiments of Dr. Goss at Purdue in the nineties, the effect of front-end design has been recognised as worthy of close scientific study, and within recent years much work has been carried out at the University of Illinois. The present publication supplements the 180-page Bulletin No. 256 issued in 1933, and to the practical designer is more useful by its very brevity. Results are given of the four types of nozzle tested, including the pepper box and six-pronged star patterns, and experiments in lowering the blast pipe and using an eccentric nozzle are described also. Interesting details are given of the reduction in resistance to the passage of the gases by removing, one portion at a time, the usual American pattern of spark-arresting diaphragms, which normally require the gases to turn through five right angles before reaching the atmosphere, and are probably responsible for the relatively enormous coal consumption of many American engines. A gyratory spark arrester was substituted with encouraging results. It is to be hoped that before long similar tests will be undertaken on the Kylala, Kylchap, and Russian cruciform blast pipes in order that generally applicable ideas as to their location and installation may become available.

Los Servicies Agrícolas en las Compañías de Ferrocarriles y sus Posibilidades de Implantacíon y Desarrollo en España. (Railway Agricultural Services and the Possibility of Introducing and Developing them in Spain). By Count Sierragorda, Secretary of the Central Aragón Railway and Director of the Madrid Agricultural Committee. Madrid, 1935. Publication No. 29 of the Railway Transport Association of Spain, Calle del Prado 26. 9½ in. × 6½ in. 92 pp.—"Spain," the author of this booklet tells us, "is not, as some uninformed persons are apt to think, the ante-room of the desert, nor is it the granary of the world, but a country of a medium agricultural character." His work is intended to show the capabilities of the country in this respect and how their rational development is worthy of attention by the railway companies. Count Sierragorda has an intimate knowledge of his subject, as was pointed out in an editorial note in our issue of July 17, 1932, having travelled extensively abroad to study methods in other countries. Although some parts of Spain are barren, there are others which are richly endowed with nature's gifts, the cultivation of which is equal to that of any corresponding parts of other lands. The Count considers that Spain equals Italy in the use it makes of its agricultural provinces, and at times approaches France, which is better endowed with rivers and means of communication. As regards wheat, the basic, or unit, production is, when everything is taken into account, not inferior to that of the Argentine or the United States. The author presents some very interesting tables showing the total riches of Spain, of all kinds, and analyses the proportion attributable to agricultural resources, with maps and diagrams indicating the distribution of the different products and their movement from one district to another, in accordance with the surplus or deficit in each one in relation to the needs of the people. The position and possibilities of the export trade in various articles are investigated as well as the traffic conveyed by the railway companies in certain selected districts. The organisation of agricultural services with demonstration trains, lectures, propaganda and educational literature, &c., already existing in other countries, is dealt with and proposals outlined for achieving similar successful results in Spain are advanced. The author is convinced that the railway companies could materially better their position by developing such an organisation on scientific lines, using the experience gained elsewhere, and that their existing financial anxieties make some such vigorous step all the more desirable.

Heat-Treatment Journal.—Wild-Barfield Electric Furnaces Limited, North Road, N.7, publisher of *The Heat-Treatment Journal*, continues in the July issue of the magazine to present illustrated articles by recognised authorities, and news of technical progress which will be of value to all concerned with the heat treatment of metals. The contents of the issue under review include articles on maintaining the quality of aircraft engine materials, by Mr. E. R. Gadd, Chief Metallurgist of the Bristol Aeroplane Company (Engine Department), and on pyrometers in industry, by Charles E. Foster, F.Inst.P. In the news section, the characteristics of Speedicase, a new rapid case-hardening paste, are outlined. This product may be used in any type of furnace, and gives approximately double the output of other compounds in a given time.

Recording Instruments. — The flexibility of electrical instruments for producing graphical records of industrial operations is well demonstrated in a new illustrated catalogue published by Evershed & Vignoles Limited, Acton Lane Works, Chiswick, W.4. Although incorporating similar basic principles, the instruments are adaptable for making measurements in such different units as gallons, ampères, tons, volts, cubic feet, or other quantity. Time is recorded as well by means of a clock drive to the chart, allowing a wide choice in the scale to which the record is reproduced. Two or more records can be traced simultaneously on the same chart. The catalogue is copiously illustrated, and the clear explanatory captions assist in the pictorial presentation of the outstanding features of these recorders. They are designed to allow of easy insertion and renewal of the charts, and an accessory is supplied which facilitates the detailed examination of the graphs produced. Electrical movements are of the moving-coil, moving-iron, dynamometer, or ratiometer types, and electrical drive to the time-recording mechanism can be fitted as an alternative to the standard clockwork.

Over the Points.—The September issue of the Southern Railway season ticket holders' quarterly review, *Over the Points*, is a Jubilee number, and deals for the most part with the company's activities in connection with the great festival of 1935. Already the Jubilee Review of the Fleet at Spithead has come to be linked in thought with the Southern Railway, so Mr. E. P. Leigh-Bennet's stirring account of the ceremony justly includes a sketch of the immense and lengthy transport preparations involved, with a tribute to the efficiency with which they were carried out. Another appropriate contribution is "Royal Progress," describing the Southern Railway Royal train and the rules and regulations imposed upon other traffic and staff when it makes a journey. Surveying passenger traffic during Jubilee Week, Mr. Leigh-Bennet reveals that 136,700 people passed the ticket barriers of Southern London termini before 10.0 a.m. on the morning of Jubilee day itself, and elsewhere he presents a table recording Royal events at Southampton from the landing of the Emperor Claudius with the Roman legions in A.D. 43 to the opening by the present King of the largest graving dock in the world on July 26, 1933.

The City and Port of Hull, 1935-1936.—An excellent and comprehensive guide to the manifold activities of this Humber port has been produced under the auspices of the City of Hull Development Committee. An effort has been made to secure that the information throughout is up to date and reliable. The book comprises 140 pages of illustrations and text and a large folding map of the town. The last-named shows very clearly the arrangement of the railway lines and stations in relation to the streets. As the volume is issued by the development committee which is engaged in promoting the industrial expansion of Hull, various articles are included to show the scope for trade. Within recent years many new industries have been established in Hull, and in certain cases this is attributed to a policy of decentralisation. We understand that a copy of this well-produced handbook will be sent free on request to any interested person making application.

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THE SCRAP HEAP

THE SILVER JUBILEE

Leaving the Central station (Newcastle) at 10.10 a.m., the Silver Jubilee is due to arrive at 1.10 p.m.—four hours to the minute.—*From the "Sunday Sun."*

* * *

Interest shown in the L.N.E.R. Silver Jubilee train at Darlington is reflected in the increase in the issue of platform tickets to people anxious to see the train make its only stop between Newcastle and London. The average daily issue is about 350, but since the express started an average of 1,000 tickets a day has been issued.

* * *

A RETURN FROM HELL

Tickets to and from Hell are an unfailing source of attraction to English tourists in Norway, many of whom are prepared to pay for the titulary right of making the journey with no intention of exercising the privilege. Hell, it should be explained, is a station on the main line from Trondheim to Sweden via Storlien (*See map p. 594.*)

* * *

EXAMPLE OF ENGLISH AS SHE IS "SPOKE" IN BRAZIL; LETTER RECEIVED BY GENERAL MANAGER OF LEOPOLDINA RAILWAY FROM APPLICANT FOR A POST

Sir,—Needing of a collocation in that important company that you are a very competent and opurse manager, I resolved to write you this, that I expose my conditions.

I am bachelor, father and mother orphan, having a young sister on my responsibility, to whom I don't mete sacrifice in order that the life do not run her as painful in our parents fault.

I always leaded an honest life and decency, not knowing the vice for where the poor caracter men slide.

That I beg you is a modest occupation. Awaiting all of your noble heart, I remain with much esteem your very faithful servant. (Name Withheld)

* * *

ENJOYING A RAILWAY JOURNEY

In order to enjoy the "enthralling scene" you must not travel too fast. I believe that Queen Victoria would never allow her trains to go at more than 35 m.p.h. She was the wisest of women. The emotions so delightfully described in your article are all familiar to me, and I should like to see its concluding words reproduced on every advertisement of holiday travel by rail:—

"The train indeed affords an intimate glimpse of England, unknown by those who only travel by air or in low-seated saloon motorcars."

That is true, and it is, I believe and hope, increasingly recognised by the wise. But, sir, this "intimate glimpse" can only be obtained, these delights can only be enjoyed, if the speed of the train is not excessive. You must be able to read the names of the countryside stations through which you pass (frequently you cannot); trees fifty yards apart must not appear on the retina of the eye as a single blur.—*From a letter in "The Times" from Sir J. A. R. Marriott.*

Ruskin might be quoted as an authority in favour of leisurely travel; but he would, I think, have condemned both "spending an hour in a restaurant car" and "doing nothing but look out of the window," as being very prejudicial to the proper enjoyment of a journey. He does not hesitate to express his opinion, in "Modern Painters," thus: "All travelling becomes dull in exact proportion to its rapidity. Going by railroad I do not consider as travelling at all, it is merely 'being sent' to a place, and very little different from becoming a parcel."—*From a letter in "The Times" from the Rev. Walter Crick.*

* * *

ELECTRIFICATION

May the editor of a humble parish magazine, having no business whatever with the subject, raise his protest against all this talk of electrifying the main railway lines of England! Electric trains were made to burrow under the earth and hide themselves, or, at least, to be confined to short distance suburban traffic. What a gloomy sight is an electric train, even one of the posher sort — engineless, graceless, worm-like things, without distinction or romance! Who would care two hoots for the Flying Scotsman or the Royal Scot if they went "all electric," and trekked across the land like glorified Underground creatures? The modern age has surely produced nothing more magnificent and watchable than a fine railway engine, massive yet beautiful, quivering with steam power, and capable of drawing a heavy train hundreds of miles at high speed! Whatever may be said about the L.M.S. (and things are said sometimes!) it has made even the humble Southend trains worth looking at with their graceful new "Tugboat Annies." The demand for electrification is surely in the same category as the demand for a reformed calendar—part of the modern flight from romance.—*The Rev. Ralph Gardner, Vicar of St. Mary's, South Benfleet, writing in his parish magazine.*

* * *

A familiar feature of Crewe locomotive works, L.M.S.R., is that part of the line leading from the station through the works. It is extensively used for the transference of engines, vehicles, and materials. The accompanying illustration, for which we are indebted to the *L.M.S. Magazine*, shows one of its more picturesque spots, where it passes in front of the general offices. This was originally part of the main line of the Chester & Crewe Railway. Growth of traffic and the difficulties occasioned by the proximity of the line to the various sections of the locomotive works, together with the necessity for extending the works themselves, led to the London & North Western Railway obtaining powers, by an Act of 1864, for a short deviation line from Crewe station to a point on the Chester branch west of the bridge carrying the road from Wistaston over the railway. This deviation line was brought into use on July 26, 1868, and since then the old line has been used purely for works purposes.

A picturesque spot in Crewe works, L.M.S.R. The tracks were originally part of the main line of the Chester & Crewe Railway

OVERSEAS RAILWAY AFFAIRS

(*From our special correspondents*)

INDIA

Railways in the Legislative Assembly

Sir Zafrulla Khan, Member for Railways and Commerce, recently stated in reply to a question in the Legislative Assembly that possibly during 1936 the Government would move a Bill in connection with the Federal Railway Authority. During the same session Mr. P. R. Rau, Financial Commissioner of Railways, informed the House that a sample third class coach of improved type was being built by the G.I.P. Railway. It would be ready for inspection by the members of the Central Advisory Committee for Railways during the next Delhi session. If the new type was adopted as the future standard for State-managed railways, company-managed railways would be requested to adopt this standard of design. It was estimated that the cost of the new design of carriage would exceed the cost of the present standard design by Rs. 5,000.

Goods Classification

Regarding the question of general classification of goods transported by Indian railways, Mr. Rau stated that the Indian Railway Conference Association, to whom the matter had been referred in 1933, had appointed a committee which was examining the question in consultation with representatives of commerce, industry and agriculture. A recommendation by the Calcutta group of railways would be considered by the Conference Association at its annual session in October. The final recommendations of the association would then be submitted to the Railway Board.

Railway Earnings and Finance

The total approximate gross earnings of all State-owned railways from April 1 to August 20, 1935, amounted to Rs. 33·37 crores, or Rs. 78 lakhs less than the actuals for the corresponding period of the previous year. In this connection the financial position of the railways was the subject of an interpellation in the Legislative Assembly. The Hon. Member for Railways and Commerce stated that the railway budget estimates anticipated a deficit of about Rs. 2 crores on the basis of an increase of about Rs. 3 crores in the gross earnings for 1935-36. As the earnings in the first four months of the year were below the figures for 1934-35, it was likely that, unless the position improved, the deficit would be considerably more than was anticipated. Any deficit ultimately found to exist would be met as usual by temporary borrowings from the depreciation fund, but railway administrations had been asked to reduce working expenses wherever possible and to examine every possibility of increasing their revenue.

In discussing the railway situation with the Indian Merchants' Chamber at Bombay, Sir James Grigg, Finance Member in the Viceroy's Executive Council, recently observed that certain provisions of the convention adopted over ten years ago for the separation of railway finances from the general budget of the country had not worked well. Under the old régime, any surplus in railway working was credited to the revenues of the Government of India and any deficit was met by the Government of India. The convention arranged that in exchange for an annual contribution to the general exchequer, the railway budget should be separated from the general budget and the railway reserve and depreciation funds were built up. Apart from the need for a revision of the convention, Sir James mentioned that the persistent deficit on current working—the early disappearance of which could not be expected in the face of the recent set-back in earnings—was a matter of anxious concern to the Government, which was giving its earnest attention to the problem of restoring solvency to the railways.

Cost of Fans in Lower Class Carriages

Sir Maurice Brayshay, Acting Chief Commissioner of Railways, recently stated in the Council of State that a capital sum of about Rs. 1½ to Rs. 2 crores (£1¼ to 1½ million) would be required to provide electric fans in third class compartments on all Class I railways. The Railway Board was unable to embark on this venture at the present moment. Sir Maurice added that information was being collected of the probable cost of fitting fans in intermediate class carriages.

Questioned whether goods vans were occasionally used for carrying passengers at the usual third class fares, Sir Maurice answered that on certain metre gauge lines and light railways, when the demand for accommodation greatly exceeded capacity, goods vans were sometimes used for conveying passengers. On such small lines it was not possible to collect coaching stock from adjacent railways and it would not be economical to provide additional stock for a few abnormal occasions. Sir Maurice undertook to inquire whether a reduction on the usual third class fares could be made when passengers were required to travel in goods vans.

Dacca-Aricha Railway

Sir Maurice Brayshay informed the Council of State that the construction of the Dacca-Aricha Railway was postponed because of the objection of the Government of Bengal on the ground of menace to public health. It was not true that the scheme was deferred on account of the opposition of the British-owned navigation companies.

Railway Amalgamation

The Financial Commissioner of Railways recently stated in the Legislative Assembly that negotiations were not at present proceeding for the amalgamation of the East Indian and the Eastern Bengal Railways under a single administration.

Road Accidents

Several months have elapsed since the formation and the first meeting of the Transport Advisory Council as an official organisation to promote co-ordination between the various forms of transport in the country. It is not known what steps the Government of India and the Provincial Governments have taken to implement the resolutions adopted by the council. With the emergence of road motors as an active factor in Indian transport services, one of the earliest duties of the Government should be the collection and periodic publication of statistics relating to road accidents. The Railway Administration Report each year contains a chapter dealing with railway accidents and it is only fair that the public should be provided with full information regarding the element of risk from accidents on road journeys. Road accidents are almost daily reported in the newspapers. It is believed that the collection of all such accidents during the year in a single report for the whole country would provide interesting data in connection with measures proposed for the control of road motor transport.

SOUTH AFRICA

Financial Position

The financial position continues to be very satisfactory. A surplus of revenue over expenditure amounting to £780,772 is reflected for the four months of the financial year April-July. The total earnings for this period were £9,944,181 and the total expenditure £9,163,409. In the expenditure figure are included two special appropriations, £183,333 towards a deficiency in pensions and superannuation funds, and £95,667 towards the rates equalisation fund. The South African Airways (S.A.R. & H.), showed a loss for the above-mentioned period amounting to £7,362. The airways figures are included in the totals given above.

Concessions to Prematurely Retired Railwaymen

Generous concessions to prematurely retired railwaymen have been announced by the Minister of Railways, Mr. O. Pirow, at a meeting between the Minister, the General Manager and other senior railway officers and certain Members of Parliament and representatives of prematurely retired railway-

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men. The Minister intimated that the Government was prepared to render further assistance to those railway servants who were retired during the period of depression before reaching the normal age limit, to the following extent:—

1. All persons who were compulsorily retired and who are in receipt of a pension will, in so far as their pensions are concerned, be placed in the position of having retired at the normal retiring age. Any additional pension accruing to such persons will be paid as from October 1, 1935.

2. Persons between the ages of 35 and 60 who were compulsorily retired upon payment of a gratuity, will be given preference in connection with the filling of any vacancies in the railway service, on the understanding, however, that they will be re-employed in a purely casual capacity.

3. Persons under 35 years of age who were compulsorily retired upon payment of a gratuity, will be given preference in connection with the filling of any vacancies in the railway service. Such persons will be re-employed in a casual capacity, but in cases where circumstances merit special consideration, the Minister will be prepared to waive the existing regulations and instructions in so far as appointment to the temporary staff is concerned.

4. The cases of any persons who were prematurely retired and who may be in necessitous circumstances will continue to be dealt with on their merits, and awards made from the charitable fund as the circumstances of each case may warrant.

5. All prematurely retired artisans who have been re-employed will not be dealt with under the above scheme, as such men, having been re-admitted to the service in a temporary capacity and contributing to the superannuation fund, will in the ordinary course of events retire at the normal retiring age, and thus become entitled to their normal pension.

JAPAN

Main Line Electrification

The Japanese Government Railways Administration has decided to accelerate the electrification of the Tokaido line, the main line from Tokyo to Kobe. Traffic is very heavy on this line which connects the six largest cities in Japan, Tokyo (pop. 5,000,000), Yokohama (650,000), Nagoya (1,000,000), Kyoto (750,000), Osaka (2,500,000), and Kobe (800,000). At present the following sections are electrified: Tokyo-Numazu, 86 miles; and Suita (five miles east of Osaka)-Kobe, 25 miles. Electrification of the sections Suita-Kyoto, 22 miles; and Kyoto-Otsu, 6 miles; had previously been decided on, and are expected to be opened in 1938 and 1939 respectively. The plans now under consideration are for the electrification of the remaining sections between Numazu and Otsu, in three stages: Numazu-Hamamatsu, 81 miles; Hamamatsu-Nagoya, 67 miles; and Nagoya Otsu, 85½ miles; the last section to be open not later than 1942.

Flood Damage

Floods caused serious damage to various sections of the Tokaido main line during August, for the third time within twelve months. All traffic on the Osaka-Kyoto section has been interrupted for 60 hours, a single track was then available until, 48 hours later, normal working could be resumed. The through trains used alternative routes during those periods. Reafforestation and extensive river training works are the only effective remedies to prevent these traffic interruptions, but the costs of these measures are immense and they fall outside the jurisdiction of the railways. The railway administration spent some Y.700,000 (£40,000) and Y.300,000 (£17,500) upon repair works on the two earlier occasions, and the last damages are estimated at Y.500,000 (£29,000). In these circumstances the administration is now contemplating the carrying out of protection works to railway embankments, estimated to cost Y.20,000,000 (£1,160,000).

CHOSEN

Speeding up on Chosen Lines

The Operating Department of the Chosen (Korean) Government Railways has planned another speeding up of the express train schedules on the main line. Since November 1, 1934, the two daily through expresses in each direction have covered the distance between Fusan and Antung, 590 miles, in 15 hr. 40 min. and 16 hr. 30 min., an improvement of 4 to 5 hours on the previous schedules. In the next winter services these expresses will be accelerated on the Fusan-Keijo (Seoul) section to cover the 279·9 miles both ways in a level six hours, with two intermediate stops. This will mean a cut of 1 hr. 45 min. on this section and it is intended to introduce similar accelerations on the Keijo-Antung section beginning with the summer services 1936.

IRISH FREE STATE

A Mystery Train

The enterprise of the Great Southern Railways in initiating a mystery train has been amply rewarded by the 650 passengers who travelled from Dublin to Cashel by the first train, arranged on Sunday, September 29. A prominent double column advertisement announcing the project was set out as under:—

GREAT SOUTHERN RAILWAYS

MYSTERY TRAIN TRIP FOR 2s. 6D.

On next Sunday, September 29 (weather permitting), a non-stop corridor train will leave Amiens Street (G.S.R.), Dublin, at 2.0 p.m. for a station situated in historic surroundings.

2½ hours' run in each direction, with suitable interval at destination to visit ruins and places of interest.

REFRESHMENTS AND TEAS SERVED ON JOURNEY

Return train will arrive in Dublin at 9 p.m.

Tickets on sale at Amiens Street and at City offices, 33, Bachelor's Walk.

Owing to the bad weather prevailing during the previous week it was feared that the experiment would not be successful, but the idea was evidently popular, as the numbers proved.

The train was started from Amiens Street station, which has direct access to the Southern, Midland, and South Eastern sections and this gave no indication of the destination, whereas if started from Kingsbridge, Broadstone, or Harcourt Street a clue to the route would have been given.

Cashel is situated approximately 109 miles from Dublin and is noted for its famous rock, on which are found the ruins of an ancient monastery of considerable interest. The company provided guides to conduct parties over the ruins and explain the historical associations. There was an interval of two hours at the station, but as the evening had turned to rain, many passengers remained in the train and regaled themselves with tea or refreshments in the restaurant and buffet cars, and a satisfactory return for the amenities provided was added to the receipts of the train. The fare—2s. 6d.—was less than half the day excursion fare usually charged for the mileage: as it was an afternoon trip it gave a happy inducement to families, couples, and parties to enjoy themselves.

Mystery Bus Tours

The mystery tours run by the omnibus section of the Great Southern Railways have proved a great success and had the advantage, from an operating point of view, that additional buses could be provided as required, or the tour cancelled if weather was unfavourable. Furthermore, it is not necessary to advise running of the road tours along the route, whereas in the case of the train, engines and staff must be in readiness and special arrangements made beforehand for the opening of the line on Sundays or at other times when it is ordinarily closed. For this reason the rail route must be fixed in advance instead of being open to change at the last moment.

It was not found feasible to arrange the mystery tours by train on Sundays during the summer owing to the demands for rolling stock, but consideration may be given to evening trips during the afternoon and long evenings next year, and by utilisation of excursion trains which arrive before midday and do not return until 8.0 p.m. or later, the question of carriage supply on Sundays may be overcome.

CANADA

C.P.R. President's Gesture at Memorial of Inter-ocean Line

The first official act in connection with the forthcoming Golden Jubilee celebration of the completion of the Canadian Pacific Railway from ocean to ocean, which takes place on November 7 next, was performed by Sir Edward Beatty, G.B.E., K.C., LL.D., Chairman and President of that great system, on September 1. Whilst on an inspection tour in British Columbia, he ordered his special train to be stopped at Craigellachie, so that he could pay his respects to the pioneer builders of this empire-making railway at the cairn erected there to commemorate the driving by Lord Strathcona of the last spike to complete the inter-ocean line, on November 7, 1885. An illustration of the cairn will be found on page 600.

TWENTY-FIVE YEARS OF RAILWAY SIGNALLING

"Probably no department of railway working has made such outstanding progress . . . . . as that of signalling."—Mr. William Whitelaw in a review of operations on the L.N.E.R. between 1923 and 1932

WHEN one considers what has been achieved in signalling during recent years the truth of the remark quoted at the head of this article becomes very manifest, but it is even more apparent when a comparison is made with conditions in the year 1910. Excluding, because they themselves would not have been possible without automatic signalling, the Underground railways of London, there was, as we shall show directly, little power-operation and still less automatic signalling.

What, however, may be regarded as a remarkable coincidence is that the year 1911 saw British railways generally adopting track circuit, as a safeguard against collisions, after the Hawes Junction accident of December 24, 1910. That an impulse was thereby given to further progress was indicated by the Metropolitan Railway, in the following year, using track circuit to hold facing points and so to dispense with the facing point locking bar. Track locking is now universal and track circuit is used for all sorts of locks on points and signals when trains approach or are standing at signals, and after they have passed them and are clear.

Power Operation of Points

At the beginning of the period under review there was no power operation of points at any terminus in London, although it was installed in two boxes in the yard at Euston and applied to the signals (but not the points) at Victoria (L.B.S.C.R.). Except on the London & South Western and the Great Central, where power boxes were provided as part of automatic signal installations (see Automatic Signalling below) the operation of points and signals by power was to be found only in the following stations: Glasgow (Central), Newcastle, Hull, Bolton, Manchester (London Road, G.C.), Crewe, Salisbury, Staines and Clapham Junction. To these were added Birmingham (Snow Hill) in 1913 and Southport in 1915.

Today, in London, there are, or shortly will be, power plants at Charing Cross, Cannon Street, London Bridge, Waterloo, Victoria, Holborn Viaduct, Paddington, King's Cross, and Fenchurch Street. It is fairly safe to assume that Liverpool Street will, within a year or so, be added to this list and there will then remain only St. Pancras, Euston, and Marylebone as London stations that are mechanically signalled. Outside the London area, additions to stations with power-operated signals and points are the following: Glasgow (St. Enoch), Edinburgh (Waverley), Thirsk, Leeds (New), Manchester (Victoria-Exchange), Manchester (Central), Cambridge, Bristol, Newport, Cardiff, and Brighton.

Automatic Signalling

Excluding, because it was not controlled by track circuit, the automatic signalling on the Liverpool Overhead, installed in 1893, and again excepting the Underground lines in London, there were only four installations of automatic signalling in this country in 1910. They were: Andover-Grateley (1902), Alne-Thirsk (1904), Woking-Basingstoke (1904-07), and the Guide Bridge widening (1906-07). There were also single sections of automatic signalling on the Lancashire & Yorkshire (1904), Great Central (1906), Great Western (1907), and Midland (1909).

Not until July 21, 1921, was there another installation of automatic signalling in this country, when track circuit-controlled signals replaced the automatics of 1893 on the Liverpool Overhead. On November 13 of the same year there followed an installation on the Mersey Railway. Both are electrically operated lines, and so it was between Marylebone and Neasden, in April, 1923, after an interval of 16 years and again on the Great Central, that the next automatic signal installation came into use on a steam railway. Then, in 1926, was started the extensive resignalling in the London area of the Southern Railway. Though it was a subsidiary effect of the changeover to power-operation, it should be mentioned here because it was only by adding automatic signals for some of the sections that the extensive elimination of boxes was possible.

The various installations opened since 1923, given under the respective companies were as follow:—

L.M.S.R.—Bow Road–Barking (1928); Barking–Upminster (1932); Mirfield (1932); Camden–Watford (1932-33).

L.N.E.R.—York-Northallerton (1931-33); Highgate branch (1932); Bethnal Green–Enfield (1933-34); Gidea Park and Shenfield widening (1933-34); Fenchurch Street–Bow Road (1933-35.)

G.W.R.—Old Oak Common (1929); Paddington–Southall (1931).

Southern Railway.—Holborn–Elephant and Castle (1926); Charing Cross and Cannon Street (1926); London Bridge (1928); North Kent East Junction (1929); Coulsdon–Hove (1932).

Mention must also be made of the very interesting installation of automatic signals, without track circuit, including the provision of automatic facing point locks, on the Swansea and Mumbles Railway (1929).

Colour-Light Signals

One of the two most remarkable developments in railway signalling during the last 25 years—the other being the long-distance operation of facing points (see below)—has been the colour-light signal, by which the "danger," "caution" and "clear" indications are given by red, yellow and green lights, respectively, that are as visible in broad daylight as at night. We mentioned above the remarkable coincidence that the year 1910 which commences the period under review, saw the general adoption of track circuit and all that the system implies in safety of operation and economies in working expenses. Another coincidence is that the same year witnessed the first daylight colour-light signal, installed at the Pennsylvania Terminus in New York. Later, the position-light signal was adopted by the Pennsylvania Railroad. It has horizontal, inclined, and vertical rows of white lights for "danger," "caution," and "clear" but it calls for mention here only because one such signal was tried at Willesden Green, Metropolitan Railway, in 1918.

The first colour-lights, as now understood, were the automatic signals already mentioned as having been fixed on the Liverpool Overhead in 1921. Then, among the automatic signals installed between Marylebone and Neasden in 1923, were some Hall single-unit signals that gave red, yellow, and green indications by means of the same unit, and so were the forerunner of what are known as searchlight signals.

The electrification of the Eastern section of the Southern Railway called for automatic signalling and the colour-light type was favoured. It revealed, however, the need

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for an additional aspect in order to secure full braking distance. The result was the double yellow, which signified "caution; pass next signal at reduced speed," whilst the single yellow meant, "caution; be prepared to stop at next signal." These indications were first used on the Holborn-Elephant section (1928) and have since been generally adopted. The single-unit signal—the searchlight—cannot, of itself, give a fourth aspect, so the double yellow is provided for by a supplementary unit. The Great Western is singular in that it gives ordinary distant indications by means of a lower unit, even with the searchlight signal. Thus, the upper unit displays only red or green and the lower unit yellow or green. A great advantage of colour-light signals is that the beams are so penetrating that they can be seen sufficiently far in fog to allow for fogmen to be dispensed with.

The colour-light signals at Mirfield (July, 1932) are on speed-signalling principles, wherein, at a junction, for instance, the upper light applies to proceeding on the straight line, *i.e.*, at normal speed, and the lower is for diverging, *i.e.*, at a reduced speed. In either case it is immaterial whether the diverging route is to the left or to the right, and thus the old practice of the top arm reading for proceeding to the left no longer holds where speed signalling is adopted. On the other hand, the top arm always applies to proceeding on the more important road.

Electro-Mechanical Colour-Light Signals

Colour-light signals, however, need electrical power and, until 1930, could not be used in areas where this was not available. In that year, however, the L.N.E.R. in the North Eastern Area began to use the Adlake electric lamp, which, from primary batteries alone, provides a light equivalent to the ordinary colour-light signal. Moreover, the customary spectacle was retained, but fixed on a level with the driver's eye and without the signal arm, and it was worked by wire from the signal box. In all respects, except that there was no arm, the signal appeared to be an ordinary semaphore. The primary batteries were given a longer interval between charging as the lamp was approach-lighted and remained extinguished except when a train was approaching and passing. Fogmen were dispensed with there also. Such an arrangement is useful not only in this country at places where there is no power supply, but should be particularly so overseas where this limitation is more general.

Intermediate Block Sections

Mention was made above of single-section installations of automatic signals on the L. & Y. (three sections), G.C., G.W. (two sections), and Midland Railways. These were opened in 1904-6, 1906, 1907, and 1909 respectively. Some worked quite independently of the adjoining signal boxes; others were controlled electrically either by the box in the rear as an advanced section signal or by the box in advance as an outer signal. In 1911 the Midland and the Great Central each added another automatic section.

The first recent adoption of this idea was in 1930, when the L.M.S. provided a near section signal, with a repeater, at Blackwell to give increased facilities for trains ascending the 1 in 37·7 gradient for two miles up The Lickey Incline. Something similar, but as advance section signalling, was done in 1934 by the L.N.E.R. on the 1 in 96 Cockburnspath bank.

In May, 1932, the L.M.S. opened the first of many intermediate block section signals, on both lines between Clay Mills Junction and Repton and Willington station on the Burton-Derby main line, thereby allowing an intermediate signal box to be closed. These signals are 2,442 and 2,313 yd. respectively from the two boxes named above. They are approach-lighted, and a new feature at the time of their installation was a detonator-placer whereby a detonator is automatically placed on the rail should the approach-lighting track circuit fail to switch in the signal. At Garstang, between Preston and Lancaster, there are up and down advance section signals, and the down signal is 3 miles 645 yd. from its controlling box.

Long-Distance Facing Point Operation

This, because of the enormous economies resulting from the closing of signal boxes, is probably the most important development in signalling, after the colour-light, during the period under review. It is, in effect, a power-operation of points, but with the power derived from a primary battery or hand-generated in the signal box. Being power-worked, in the sense of the Ministry of Transport Requirements, such points have no limit as to distance from the signal box. By a coincidence, the first two installations—one on the Great Central and one on a privately-owned colliery line in Northumberland—were opened on the same date—in November, 1921. They were worked by local batteries. In 1924 the hand-generator method was introduced at Charleville in Ireland. In an installation in Co. Longford some points, operated by hand-generator, are 3¼ miles from the box.

Centralised Traffic Control: Relay Interlocking

What, in effect, is very advanced long-distance operation is centralised traffic control. In an installation at Wembley Park (Metropolitan Railway) opened in December, 1932, the signalman controls five sets of double-ended points and twelve signals at Stanmore, 4½ miles away.

The control-panel locking frame, with relay interlocking, was introduced in the North-Eastern Area of the L.N.E.R. in 1933, and used in some of the boxes in the York-Northallerton resignalling. The new box at Thirsk was so equipped, with route-lever signalling added. As illustrative of the latter feature, it may be said that one switch on the control panel actuated 14 sets of points and one signal, and the complete movement was made in 6 seconds.

Automatic Train Control

In 1910 there was no automatic train control in this country except the train-stopping device on the Underground. There were, however, cab-signals on the North Eastern and the Great Western, as a substitute for fog-signalling.

A.T.C. was mentioned in the Board of Trade report on the Slough, G.W.R., collision of June 16, 1900, but only to point out its difficulties and that "the use of such a machine may introduce greater risks than those which it was intended to remove." In the report on the Ais Gill (M.R.) collision of September 3, 1913, it was, however, definitely recommended. But nothing was done, even though a departmental committee considered the subject and advised its adoption in 1920-1922. Another departmental committee was appointed on November 1, 1927, and during its deliberations it was announced, in October, 1928, that the Great Western, whose cab-signal (1906) had meanwhile been converted to A.T.C., would extend the use of the apparatus, from between Paddington and Reading, to the greater part of the main line.

Rail-Brakes

The provision of rail-brakes, or retarders, in gravity marshalling yards, whereby the speed of wagons, after leaving the hump, is mechanically checked, may be regarded as signalling, especially as some of the points in the sidings are actuated from the control tower. The up

yard at Whitemoor, L.N.E.R. was equipped with hydraulically-operated rail-brakes in 1929 and the down side yard with eddy-current rail-brakes in 1933. The same company's yards at Hull and Mottram are to have hydraulic rail-brakes.

The Triumph of Track Circuit

The present article began with a reference to the general adoption of track circuit in 1911, and it is fitting that we should end our record by remarking that, despite the remarkable development of colour-light signals and the long-distance operation of facing points, it is perhaps the uses to which track circuit has been applied that are the really outstanding feature of the period reviewed. We have divided our review under seven headings: power operation; automatic signalling, including colour-light signals; intermediate block signals; long-distance point operation; automatic train control; centralised traffic control; rail-brakes. Every one of these, except automatic train control, is dependent upon track circuit. Track circuit is the main basis of the illuminated diagram, without which the greater areas now protected at, say, London Bridge, Brighton and St. Enoch, in comparison with the plants installed ten years ago at Manchester (Victoria-Exchange) and Cambridge, would not have been considered possible. The long-distance operation of facing points and centralised traffic control need track circuit to hold the points that are out of the signalman's sight and to let him know the position of the trains that are using or are to use the points. Track circuits are essential to the use of rail-brakes in order that the controller may know when vehicles are clear.

Economies Due to Signalling

All the subjects we have thus briefly reviewed, except again automatic train control, have been productive of great economies in the operating department. The substantial sum of £90,000 saved annually on the Southern Railway by the closing of 200 signal boxes was referred to in Mr. A. J. Pearson's paper on "Economic Aspects of Railway Signalling," in our issue of May 10 last, and whilst we would not claim that the drop in the amount paid yearly in wages to signalmen is wholly due to changes in signalling methods having reduced the number of boxes, it is obvious that a very large percentage is due to that cause. It may therefore be noted that in 1930 the L.N.E.R. had 7,957 signalmen and paid £1,600,000 in wages to signalmen and that the Southern had 2,635 men and paid out £579,000. For 1934 the corresponding figures for the L.N.E.R. were 6,989 men and £1,365,600 and for the Southern 2,385 men and £506,900. How true, then, was the remark embodied in our title that "probably no department of railway working has made such outstanding progress . . . as that of signalling."

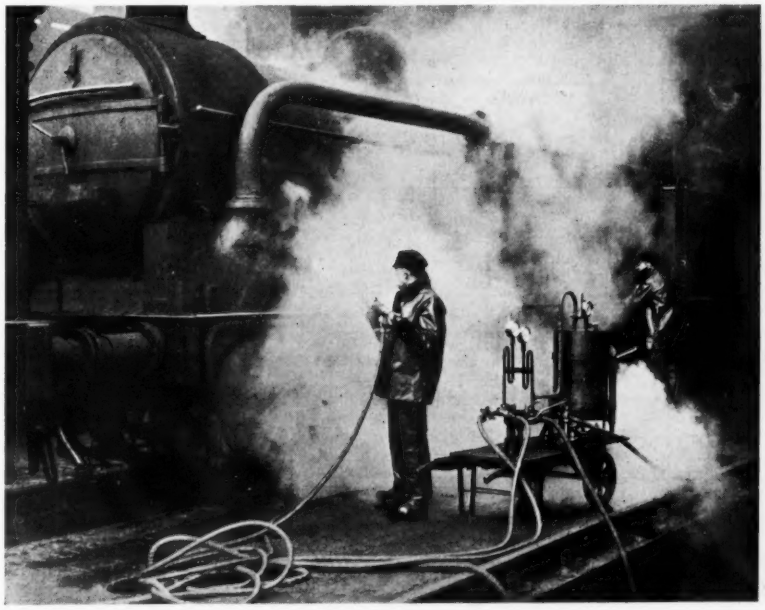
ENGINE CLEANING ON THE L.N.E.R.

Portable high-pressure hot water and steam, soda ash and cleaning oil apparatus installed at the company's locomotive shed at Hornsey

On pages 18 and 19 of the issue of THE RAILWAY GAZETTE dated January 5, 1934, we published an article illustrating and describing the spray-cleaning of locomotives at King's Cross locomotive depot, L.N.E.R. in this system jets of hot water are used at a temperature of about 120° F., with the addition of chemicals consisting of soda ash and cleaning oil.

Recently an apparatus introduced for the same purpose, but utilising a mixture of steam and hot water, has been installed at the company's locomotive depot at Hornsey. This portable plant, which is illustrated herewith, consists of a high pressure injector manufactured by Davies & Metcalfe of Manchester, which supplies a mixture of steam and hot water at a pressure of 400 lb. per sq. in. at a temperature of about 195° F. The steam pressure necessary to operate the plant under these conditions is 100 lb. per sq. in., and is taken from an adjacent engine or other source by a flexible pipe; the water supply is obtained from a hydrant in the engine shed.

Two guns are coupled to the injector by means of flexible pipes and discharge 600 gallons an hour each. When the dirt has been removed by the steam and hot water, a little oil is introduced into the mixture to impart a good finish. One engine cleaner operates each gun and a suburban tank engine can be thoroughly cleaned by two cleaners in the space of two hours.



New portable plant for washing locomotives at Hornsey sheds

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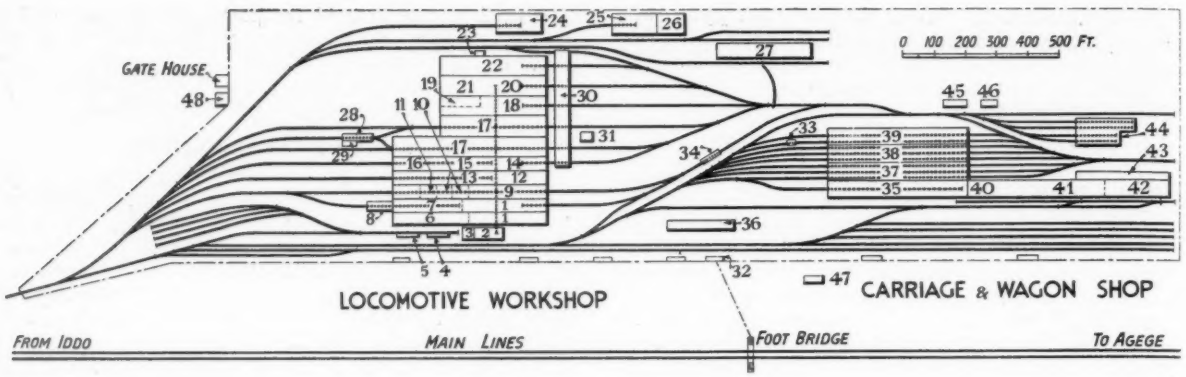
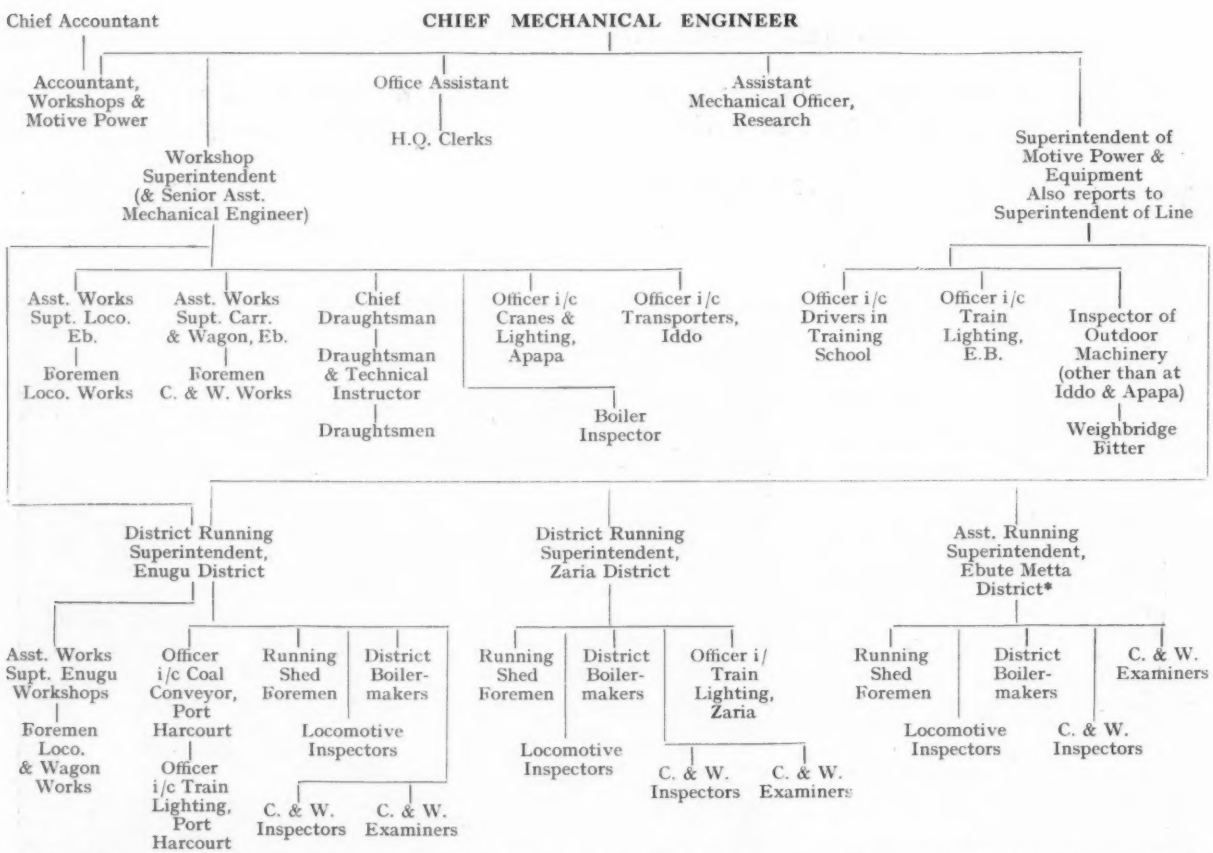


1. Smithy
2. Coppersmith's shop
3. Pattern store
4. Pig iron storage
5. Scrap storage
6. Iron foundry
7. Brass foundry
8. Fettling shop
9. Light machine shop
10. Tool room and store
11. Hardening and tool shop
12. Brass shop
13. Heavy machine shop
14. Engine wheel repair shop
15. Axleboxes, brake gear and miscellaneous
16. Motion shop
17. Erecting shops
18. Boiler machine shop
19. Tube repair section
20. Boiler mounting
21. Boiler repair shop
22. Tender repair shop
23. Air compressor house
24. Points and crossings shop
25. Millwrights' shop
26. Power house
27. Locomotive sub store
28. Steaming shed
29. Weighbridge shed
30. Traverser
31. Gas producing plant
32. Time house
33. Weighbridge shed
34. Inspection pit
35. Body building shop
36. Upper floor: C.M.E., W.S., S.M.P. and drawing office. Ground floor: A.W. Supts. and accounts offices
37. Wagon repair shop
38. Carriage repair shop
39. Bogie wheel and frame shop
40. Carpenters and joiners
41. Woodworking machines
42. Rough timber storage
43. Timber seasoning shed
44. Paint shop
45. Train lighting shop
46. Oil and axlebox packing store
47. Technical institute
48. Electrical store

Fig. 1—General layout of the shops showing their various sections


Chief Accountant
CHIEF MECHANICAL ENGINEER
Accountant, Workshops & Motive Power
Office Assistant
H.Q. Clerks
Assistant Mechanical Officer, Research
Workshop Superintendent (& Senior Asst. Mechanical Engineer)
Superintendent of Motive Power & Equipment Also reports to Superintendent of Line
Asst. Works Supt. Loco. Eb.
Foremen Loco. Works
Asst. Works Supt. Carr. & Wagon, Eb.
Foremen C. & W. Works
Chief Draughtsman
Draughtsman & Technical Instructor
Draughtsmen
Officer i/c Cranes & Lighting, Apapa
Officer i/c Transporters, Iddo
Boiler Inspector
Officer i/c Drivers in Training School
Officer i/c Train Lighting, E.B.
Inspector of Outdoor Machinery (other than at Iddo & Apapa)
Weighbridge Fitter
District Running Superintendent, Enugu District
District Running Superintendent, Zaria District
Asst. Running Superintendent, Ebute Metta District*
Asst. Works Supt. Enugu Workshops
Foremen Loco. & Wagon Works
Officer i/c Coal Conveyor, Port Harcourt
Officer i/c Train Lighting, Port Harcourt
Running Shed Foremen
District Boiler-makers
Locomotive Inspectors
C. & W. Inspectors
C. & W. Examiners
Running Shed Foremen
District Boiler-makers
Locomotive Inspectors
Officer i/ Train Lighting, Zaria
C. & W. Inspectors
C. & W. Examiners
Running Shed Foremen
District Boiler-makers
Locomotive Inspectors
C. & W. Examiners
C. & W. Inspectors

* For financial year 1934–35 only did this district have a running superintendent. Thenceforward the district has been supervised from the Superintendent of Motive Power's headquarters

Fig. 2—Establishment chart, 1934, Mechanical Department, Nigerian Railway

THE LOCOMOTIVE, CARRIAGE & WAGON WORKSHOPS OF THE NIGERIAN RAILWAY

By Major M. P. SELLS, O.B.E., M.I.Mech.E., M.I.Loco.E., Chief Mechanical Engineer

Part I—General description of the shops ; organisation, costing, scheduling and progressing methods

THE main locomotive, carriage and wagon workshops of the Nigerian Railway are situated at Ebute Metta, near Lagos. The buildings are of steel framing with saw tooth type of roof having north lights, and cover an area of nearly 8½ acres. The area within the works fencing is 58 acres. The diagram (Fig. 1) shows the general layout of the workshops and the various sections comprising them. The Mechanical Department of the Nigerian Railway includes both running and workshops sections. The chart (Fig. 2) shows the organisation, the methods of supervision and the division of responsibility. The staff consists of European foremen and assistants, and African chargemen and artisans. Most of the African chargemen have been trained within the last 8 to 10 years under an indentured apprenticeship scheme extending over 5 years. Technical education has been provided for them in a school situated in the works yard, and a number are studying for some recognised engineering diploma.

The shops are supervised by a Workshops Superintendent, assisted by two fully qualified Assistant Workshops Superintendents, one in charge of the locomotive group and the other of the carriage and wagon group. The output of repaired locomotives is based on a unit system, for costing and statistical purposes, as follows:—

Locomotives	Unit
Heavy general repairs	10
Light general repairs	5

It was found that the cost of repairs bore a close relation to the unit, which was fixed at £80. The locomotive shops have a maximum capacity of 720 units of repaired or converted engines per annum.

The light general repair (B)—which originally consisted of tyre turning, axlebox and motion repairs—grew, under the former divisional system of organisation, into practically a general repair in each case, except that the boiler was not removed. Under the recent reorganisation, the light or "service" repair has been reintroduced; the parts for which treatment are specified by the running section. The cost of all repairs includes direct labour and materials, plus overhead charges, which consist of European and African supervision, European passages and the cost of electric power, fuel and water. The total workshops expenses are, therefore, fully accounted for in the cost of all work turned out; whether it be locomotive repairs (A or B) or work done for the Stores Department of the railway, other Government departments, or private firms. The overhead charges are worked out separately for each section of the shops every quarter, and the appropriate on-cost added as a percentage of the direct labour.

All work is booked to work orders, and a "job card"

NIGERIAN RAILWAY—MECHANICAL DEPARTMENT.

Reversing Gear.

Progress Office,
Ebute Metta Workshops,
..... 193

Mr. Bate

Motion Shop No. 7.

Class of Repair A

Engine No 288

INSPECTION AND REPAIR NOTE.

Please have the undermentioned work carried out and charged to Engine 288 LR/A/288/361.

R.P.—250 of 35 trip.—1270-1-33

Distinctive No.	Drawing No.	Quantity	Operation number and Description.	Step Size.	Operation, Repairs or Renewals.	Time taken H.	Time allowed H.
2923	1734B	1	35. Re-fitting reversing screw in bracket with new nuts, washers and wheel complete		Screw to weld Renewal.		
		1 bush	Reverse Screw Nut			62	
5021	1074	1 "	36. Fitting trunnion lever bushes and pins	2½" x 2⅜ x 3"	5" Renewals		
			37. Rebushing reversing screw arm holes in quadrant				
1703 "	1491 "		38. Lapping out reversing rod holes, back and front, and fitting pins	B5 B9	Renewals	2	
			For operation 39 see welding sheet				
5011 5021	1074 "	2 1	40. Rebushing reversing shaft arms R.H. & fitting pins L.H. Reversing rod		Renewals	7	
			41. Lapping out reversing link R.H. L.H. Centre				
2874	1662B	2 one Reed:	42. Fitting die to rev. link R.H. L.H. Centre		Renewals	16	
5030	1221	4	43. Renewing bushes in rev. link carrier and fitting reversing link brackets R.H. outside inside L.H. outside inside Centre outside inside			48	
			44. Reaming bushes to fit trunnions on reversing link		Operation 44	28	
			45. Fitting oil box tops (particulars of renewals required to be given on separate sheet)		Operation 45	4	
5011	1074	2	46. Renewing bushes in reversing link R.H. L.H. Centre		Renewal	2	
			Trunion Lever Pin Bracket		Hole to weld & bore std:	8	
		3	Reversing Link Rivets	L.H.	To fit bush	4	
		2	Trunion Lever Blocks.		To sample	12	

Passed to P.O.
(intd.) A.T.

Fig. 3—Specimen sheet of inspector's report

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	D=Date stripping commenced (Operation 1, Stage 1)
1. Buffer beams when removed for straightening or welding	D + 7 days.
2. Horncheek bolts	D + 9 ,,
3. Rubbing block bolts	D + 10 ,,
4. Drag casting bolts	D + 10 ,,
5. Hornstay studs	D + 10 ,,
6. Hornstays	D + 10 ,,
7. Axlebox lubricator pipes and oil boxes	D + 11 ,,
8. Reversing link carrier plate bolt or studs	D + 11 ,,
9. Couplers and draw gear	D + 11 ,,
10. Compensating beams and pins	D + 11 ,,
11. Brake shaft and brackets	D + 12 ,,
12. Running plates	D + 13 ,,
13. Rubbing blocks (when renewed)	D + 13 ,,
14. Steam brake cylinder	D + 13 ,,
15. Steam chest liners	D + 14 ,,
16. Cylinders if removed	D + 15 ,,
17. Hind steam chest covers	D + 15 ,,
18. Valves, spindles and packing	D + 15 ,,
19. Intermediate valve rods	D + 15 ,,
20. Hind cylinder covers	D + 16 ,,
21. Slide bars	D + 17 ,,
22. Axleboxes (coupled) for fitting in horncheeks	D + 19 ,,
23. Pistons and rods	D + 21 ,,
24. Crossheads	D + 21 ,,
25. Metallic packing (complete)	D + 21 ,,
26. Reversing link brackets	D + 21 ,,
27. Reversing links	D + 21 ,,
28. Reversing screw, bracket and handle	D + 22 ,,
29. Radius rods	D + 22 ,,
30. Lifting links	D + 22 ,,
31. Combination levers	D + 22 ,,
32. Crosshead arms	D + 22 ,,
33. Connecting links	D + 22 ,,
34. Reversing shaft and brackets	D + 22 ,,
35. Leading bogie (complete)	D + 23 ,,
36. Trailing bogie or truck (complete)	D + 23 ,,
37. Coupled wheels complete with axleboxes, springs, hangers and adjusting screws	D + 23 days.
38. Brake gear	D + 23 ,,
39. Front cylinder covers	D + 23 ,,
40. Smokebox steam pipes	D + 23 ,,
41. Blast pipe and blast pipe top	D + 24 ,,
42. Chimney	D + 24 ,,
43. Connecting rods	D + 24 ,,
44. Eccentric crank arms	D + 24 ,,
45. Eccentric rods	D + 24 ,,
46. Bye pass valves and pipes	D + 24 ,,
47. Bogie and truck centre pins	D + 24 ,,
48. Vacuum exhaust pipe	D + 25 ,,
49. Blower pipe	D + 25 ,,
50. Spark arrestor and all other smokebox mountings	D + 25 ,,
51. Smokebox door, dart, crossbar and handles	D + 25 ,,
52. Washout plugs	D + 26 ,,
53. All boiler mountings and gauges	D + 26 ,,
54. Regulator valve and gear	D + 26 ,,
55. Dome cover	D + 26 ,,
56. Fire doors and gear	D + 26 ,,
57. Footsteps	D + 26 ,,
58. Sight feed lubricator	D + 26 ,,
59. Injectors	D + 26 ,,
60. Ejector and piping	D + 26 ,,
61. Steam pipes for ejector, injectors, whistle, all gauges and water gauge cocks	D + 26 ,,
62. Feed and water pipes for injectors	D + 26 ,,
63. Cylinder cocks and all gear	D + 27 ,,
64. Cylinder oil pipes and connections	D + 27 ,,
65. Sandboxes and all gear	D + 28 ,,
66. Reversing rod	D + 28 ,,
67. Cowcatcher and/or lifeguards	D + 28 ,,
68. Front steam chest covers	D + 30 ,,
69. Coupling rods	D + 30 ,,
70. Tender	D + 31 ,,

Fig. 4—"B" class repair. Scheduled times for return of repaired or replaced material to the erecting shop for a 701-729 class, 4-8-2 locomotive

system is used in the shops in respect of direct labour. All work in the carriage and wagon repair shops is costed and accounted for in exactly the same manner, the unit system being in force for production and statistical purposes.

Scheduling and Progressing of Engines

Engines for general repairs (A) are "proposed" for the shops from two to three months before they are due on a mileage basis of from 90,000 to 110,000 miles. On the proposal form are given particulars of the condition of tyres, cylinders, axles, slidebars, &c.; it can, therefore, be ensured that the necessary material is available for replacement if required.

On arrival in the erecting shop, all parts, after stripping and cleaning, are examined by gauge or micrometer; the disposal of each is decided by the inspector and duly entered in the inspection and repairs report. A specimen sheet of this report is reproduced (Fig. 3). Each detail is given on these sheets, so that nothing can be missed. Limits of wear have been fixed for each working part, and within these limits a part is reconditioned. After inspection, the inspection and repairs statement is prepared, and the parts are distributed to the various repair sections of the shops, together with a copy of the relevant inspection and repair sheet and accompanied by a work order giving the allocation. Thus full particulars of exactly what is required to be done, and the date on which parts are to be sent to the erecting shop, is furnished to each repair section. The dates are chalked on the progress boards in each section. These boards show at the side all the parts dealt with by the section and, along the top, the day of the month. Space is provided for two months.

Scheduled time sheets for the return of repaired parts

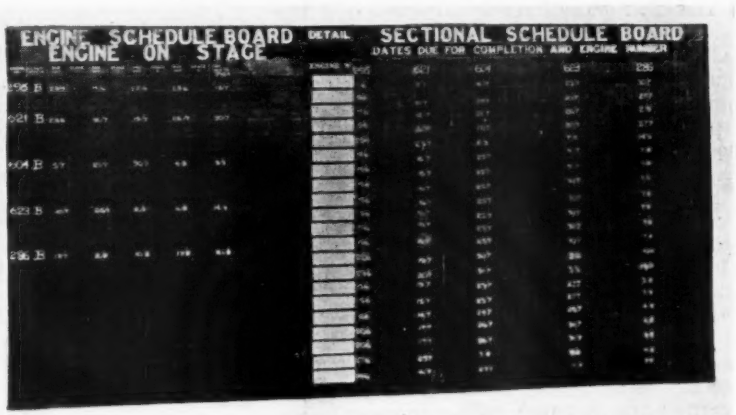


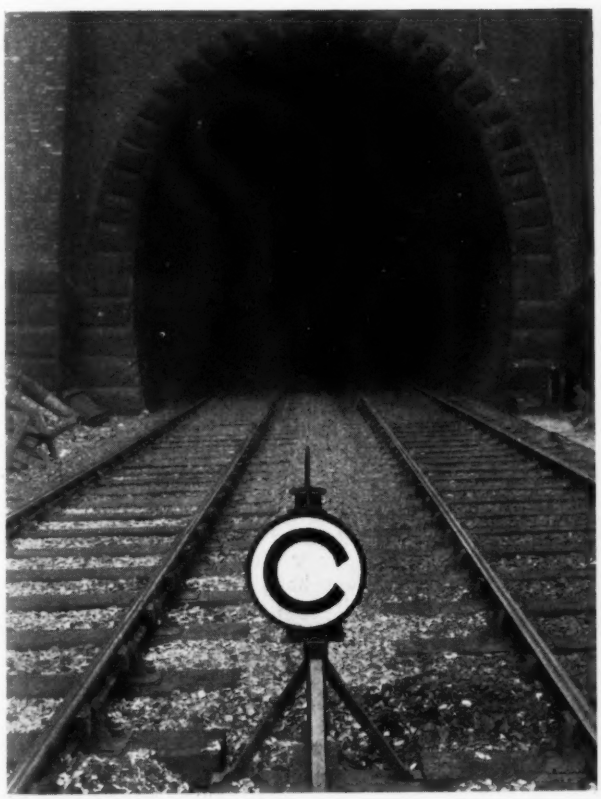
Fig. 5—Progress schedule board

to the erecting shop have been worked out for various classes of engines. One of these sheets for the repairs of a number of classes of the 4-8-2 type of engine is reproduced (Fig. 4). The inspection and repair sheets are prepared in triplicate, one copy going to the repair section concerned, *i.e.*, brass shop in the case of boiler mountings, wheel shop in the case of wheels, and so on; one to the erecting shop foreman, and the third to the progress office. Here the scheduled dates on which the parts will be required in the erecting shop are calculated from the schedule time sheets, and the inspection and repair sheets are put into a cabinet having two tiers of thirty-one divisions, representing the days of the month. At the top of each tier of pigeon holes, the name of the month is chalked, and the progress office copy of the inspection and repair sheet is placed in the appropriate division, which represents the day before the material is required in the erecting shop. The progress office staff has certain work for completion each day, and it is their duty to keep in daily contact with all details to ensure they are completed on the specified date. They also have to see that repairs are started early enough to allow of them being completed to time. When all the dates have been fixed for a particular engine, the stage boards in the erecting and boiler shops and the sectional repair boards are entered up with the engine number and the completion date. A photograph of the master board showing the situation in all sections is reproduced (Fig. 5).

From the information given on the inspection and repair sheets, requisitions are prepared on the locomotive storekeeper for the necessary new material required from stores. The date the material is to be issued is also given. Daily meetings are held by the Assistant Workshops Superintendent with the shop foreman concerned and the progress officer, when any delays are reported and steps taken to expedite delivery of the necessary material to the erecting shop; while any out of balance factor in any section of the shops is reported and corrected. A similar system is used for the scheduling and progressing of boilers in the boiler shop in ten stages. These methods have had the result of reducing the time engines are in the shops under repair by as much as 100 per cent.

We hope to publish the next instalment of this article in our issue of November 8.

Illumination of Speed Limit Boards



Many complaints having been made by enginemen of the difficulty of sighting warning boards and C and T indicators at night, the London Midland & Scottish Railway, in conjunction with Lamp Manufacturing & Railway Supplies Limited, have evolved an improved lamp which has now been adopted as standard and is already much appreciated for the more brilliant light it gives. We illustrate herewith the special type of warning board now used in restricted spaces. Two Adlake lamps are used, one with a white lens and the other with a green lens, both showing through openings in the board which is surmounted by the 15 m.p.h. warning signal, also illuminated by an Adlake lamp. Similar lamps are, of course, used for the normal warning boards where space restrictions do not compel the adoption of the dwarfed type. The letters C and T stand for "commence" and "terminate" and indicate the limits of the speed restriction specified.

XUM

THE HORSE-POWER OF LOCOMOTIVES—ITS CALCULATION AND MEASUREMENT—VII

By E. L. DIAMOND, M.Sc. (Eng.), A.M.Inst.C.E., A.M.I.Mech.E.

This is the seventh and conclusion of a series of articles giving a critical account of the work that has been done in various parts of the world on a subject that today has acquired a new importance in view of the competition between the steam locomotive and other methods of railway traction. The previous articles appeared in our issues of April 12, May 3, June 14, July 26, September 6, and September 20.

CONCLUSION

Testing—The Present Position.—Although the constant-condition road tests already described are characteristic of European as distinct from American practice, there are a number of stationary testing plants in Europe, including the most up-to-date in the world, that recently opened at Vitry in France. At the present moment there is a strong division of opinion in European countries between the European and American methods of testing, though it is to be noted that in those countries which have developed scientific methods of road testing, some of which also possess stationary testing plants, the constant-condition road test is favoured for the routine determination of locomotive performance characteristics whilst the stationary plant is regarded as more suited to special tests to establish the value in terms of thermodynamic efficiency, of special devices. Thus the German State Railway possesses a modern and well-equipped testing plant at Grunewald, but reserves it chiefly for special tests of this nature. Its routine performance tests are carried out by road trials with brake locomotives, as these are not only found to be perfectly satisfactory, but also give results which may be applied to normal train running conditions with more reliability, and in addition are less expensive than tests on the stationary plant.

On the other hand, the French claim that results of much greater accuracy can be obtained on the new testing plant at Vitry than would be possible under conditions on the track, and, so far as individual measurements are concerned, it is probable that this is true. It is to be remembered, however, that the French have had only a limited experience with constant-condition road tests in the case of one administration only, so that the comparison in this case is possibly intended to apply to road tests under ordinary service conditions, which, as has been seen, are practically valueless for the accurate determination of performance characteristics.

Very recently the Italians have considered the question of what method to adopt and have decided upon constant-effort road tests with a brake locomotive. They claim* that such tests, if carried out with a dynamometer car of the most modern type, give results fully equalling in accuracy those obtained on a stationary plant, and more useful than the latter in that they are made under actual running conditions as regards air resistance, and oscillating movements of the locomotive and other tendencies depending on the effect of centrifugal force on curves, or on the action of the spring suspension gear.

It is a questionable point, however, whether the inclusion of wind resistance in measurements based on the "equivalent drawbar pull" should be regarded as an advantage. This, it is true, is the pull available for drawing trains (on the level), but its value is influenced by a factor (the wind resistance) which is only to a partial extent dependent on the design of the locomotive. In tests of the Russian type, based on the tractive effort at the rim of the driving wheels, this factor is eliminated. On the other hand, the proposals for an English stationary testing plant* include the provision of a wind tunnel by means of which this factor could, if necessary, be included as a known quantity in the test measurements.

The effect of oscillations is only indirect, chiefly by promoting circulation in the boiler. Tests in America have definitely shown that a higher maximum rate of evaporation can be obtained on the track than on the testing plant. The effect on tests at a normal rate of evaporation is probably not very great since a considerable amount of vibration, if not of oscillation, takes place on a testing plant. Professor Lomonossoff has made a direct comparison† between constant-condition road tests and stationary plant tests of two 0-10-0 locomotives respectively, of the same type. The road test results were as regular as those obtained on the stationary plant, but tended to show slightly greater indicated powers at the higher speeds. He attributed this to inaccuracies due to the use of a longer indicator pipe in the road tests.

Testing—The Future.—The question as to which is the better method of testing is best decided by reference to the main objective underlying the testing. For the purpose of locomotive research, that is to say the study of individual factors in design and their effect on efficiency, the stationary testing plant undoubtedly offers advantages. For the more general purpose of acquiring systematic data by means of which locomotive power may be used more efficiently and train operation expedited, the experience of those administrations which have developed a routine method of constant-condition road testing for the determination of performance characteristics seems to show that this is the more satisfactory, and certainly much the cheaper, method.

Calculation—The Work of Strahl.—Even constant-condition road tests are expensive to carry out, however, and when sufficient data have been acquired it is not unlikely that further attempts will be made to evolve a satisfactory formula or formulæ by which the power of any new locomotive type may be determined with sufficient accuracy for train operation purposes. Increasing standardisation in design will also help to bring this ideal nearer. It has been made clear that the essential problem is to find some reliable expression for the relationship between speed and mean effective pressure.

The late G. Strahl made a tentative move in this direction in his study "Der Einfluss der Steuerung auf Leistung, Dampf- und Kohlenverbrauch der Heissdampflokomotiven" (The Influence of the Valve-Gear on the Performance and Steam and Coal Consumption of Superheater Steam Locomotives).‡ Proceeding from a geometrical analysis

* *Le Tecnica Professionale*, 1934, p. 283.

* Proc. I.Mech.E., 1931, vol. 121, p. 23.

† "Lokomotivversuche in Russland," p. 86.

‡ Published by Hanomag-Nachrichten-Verlag G.m.b.H., Hannover-Linden, 1924.

of the indicator diagram he evolved an expression for the mean effective pressure in terms of:—

(1) Cut-off.
(2) Clearance space.
(3) Steam pressure in the valve chest.
(4) Piston displacement during compression.
(5) Piston displacement during release.
(6) Mean back pressure.
(7) Pressure drop at moment of closing of admission valve.
(8) Exponents of laws of expansion and compression.

Items (6), (7), and (8) require separate estimation. He assumed, because back pressure is generally lower in stationary engines than in locomotives, that the back pressure depends on the sectional area of the blast pipe orifice rather than on the valve gear and is directly proportional to the square of the quantity of steam and inversely proportional to the square of the area of the blast pipe orifice. He gave empirical values for the constant in the relation. The pressure drop during admission depends on the cut-off, speed, cylinder volume, port width, steam lap, lead, clearance space, and quality of the steam. A theoretical analysis of the problem leads to an insoluble differential equation, but by means of an approximation Strahl evolved an expression* for the pressure drop in terms of these known quantities and an experimental coefficient for the resistance to flow through the valve opening and port. As regards the exponents of the laws of expansion and compression, he showed the influence of their precise value to be negligible and the use of an average value to be therefore permissible.

Lipetz reports† that he attempted to apply Strahl's formula to an American locomotive. It took an experienced calculator two days to obtain three values for the mean effective pressure and these were not in agreement with test results. Strahl himself, however, made it clear that it was not his intention that the formula should be used for the purpose of general calculation of tractive effort. The Prussian State Railway had recently adopted a standard piston valve for superheater locomotives. A two-cylinder and a three-cylinder locomotive having the same total cylinder volume were equipped with the standard piston valves (two and three respectively), but although, as was to be expected, the throttling during admission was found to be greater in the locomotive with only two valves, the effect on steam and fuel consumption appeared to be negligible. This was contrary to the general opinion in Germany at that time regarding the adverse effect of throttling at admission and Strahl wished to analyse quantitatively the factors at play in order to explain why this should be so. He drew a number of curves giving the values for component expressions in his equation for mean effective pressure, as applied to the Prussian State Railway locomotives, in order to facilitate this analysis, and tabulated the results for various speeds. These he found to be in good agreement with indicator diagrams, and therefore to confirm the conclusions based on the experience of the railway.

It is to be observed that Strahl's method of dealing with the back pressure is hardly consistent with the comparatively rigid theoretical treatment of the drop of pressure during admission. The writer's own investigations* show that at high speeds, when the phenomenon is of much greater importance since it becomes a limiting factor in the power as well as the efficiency of the locomotive, the effect of the valve gear on back pressure cannot be neglected, and may indeed be the paramount factor in the locomotive's performance.

Difficult though the theoretical estimation of the admission throttling is, a purely theoretical approach to the problem of back pressure, at any rate at high speed, is almost unthinkable, and it is evident therefore that Strahl's work is likely to remain abortive until experimental research of a much more detailed character than has hitherto been contemplated, is undertaken, possibly by means of a locomotive engine unit set up in a laboratory, and supplied with steam from a stationary boiler. Strahl himself made reference to the work of Lihotzky,† who plotted average curves of mean effective pressure from a large number of indicator diagrams obtained from locomotives of various types, but, as he remarked, by taking average valve gear proportions as a basis, Lihotzky left the question of the influence of the valve gear more or less untouched.

Acknowledgment.—The writer wishes to acknowledge the information and guidance kindly given to him by Professor Dr. Ing. G. V. Lomonossoff.

* Strahl's formulæ are not reproduced here. They are of little practical value as yet. All that is intended is to indicate the lines followed by Strahl so that a general idea of this aspect of the subject may be formed.

† Trans. A.S.M.E., 1933, vol. 55, RR-55-2.

* See Proc. I.Mech.E., 1927, p. 465.

† Z. des österr. Ing. und Arch. Vereins, 1915, vol. 26.

Pioneer Railway Engineering in South Australia

Some interesting and little known details of early railways in South Australia were given by Mr. C. B. Anderson in his chairman's address last year to the Adelaide Division of the Institution of Engineers, Australia, the text of which has only just been published in the current issue of the institute's *Journal*. In South Australia, the first rail track was opened on May 18, 1854, and consisted of a tramroad from Goolwa to Port Elliot, along which, according to old photographs, a weird looking passenger car and trucks were hauled by a horse. On April 21, 1856, the Adelaide to Port Adelaide railway (5 ft. 3 in. gauge) was opened, and this, so far as the author can ascertain, was one of the first, if not *the* first, State-owned steam-operated railway in the British Empire. It was followed by the line to Gawler, opened in 1857, and extended to Kapunda by 1860. In the 'seventies isolated railways were pushed inland from Port Pirie, Port Wakefield, and Kingston. These were constructed to 3 ft. 6 in. gauge, and as the 5 ft. 3 in. gauge lines steadily advanced north and south of Adelaide, the inevitable breaks of gauge came into being at Terowie, Hamley Bridge, and Wolseley. The conversion of the 200 miles of track between Hamley Bridge, Moonta, and Gladstone, from 3 ft. 6 in. gauge to 5 ft. 3 in., in 1927, eliminated the break of gauge at Hamley Bridge, but created one at Gladstone.

No fewer than 17 distinct types of rail, differing in weight or profile, have been used on the South Australian Railways. These range from 35 lb. iron rails, laid in the Naracoorte to Kingston line in 1876 (and still in existence there) up to 100 lb. steel, Australian standard, used in relaying between Adelaide and Murray Bridge. The Goolwa to Port Elliot tramway, referred to above, was laid with 40 lb. iron rails of ordinary T section, but the line to Port Adelaide was constructed with bridge pattern iron rails, 63 lb. to the yard, similar to Brunel's rails on the old 7 ft. gauge G.W.R. in England. For the Gawler to Kapunda line, in 1860, a reversion to typical English practice was made by using 65 lb. iron rails of the double headed type, with cast iron chairs and wooden keys. Some of this permanent way still survives in sidings. All subsequent construction was carried out with ordinary T pattern rails, and steel rails (41 lb.) were first used in 1878.

XUM

THE CAIRO-SUEZ DIRECT LINE, EGYPTIAN STATE RAILWAYS

Passenger services will be worked by diesel railcars, but goods is still worked by steam, as it has been since December last

AMONG the early railways in Egypt was a direct line between Cairo and Suez which followed the old coach road. It was completed in 1858 and provided a link in the chain of communication between Europe and the Far East (to which we make editorial reference on page 576) from its date of opening until the completion of the Suez Canal in 1869, when the railway was taken up and rail connection with Suez was provided from Ismailia.

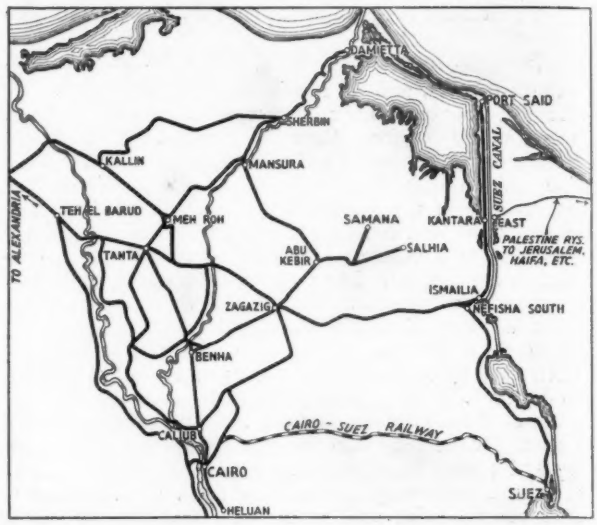
In 1930 it was decided to re-construct the old line, with a view to giving more direct communication between Cairo and Suez, and thus develop the latter as a summer resort. The line leaves the Marg line at Ein Shams station, follows generally the original alignment, finally to join the Ismailia-Suez line just outside Arbain station. Intermediate stations are again provided at El Ribeiqi (km. 45) and Gebel Iweibid (km. 86·5), thus dividing the line into three block sections: Ein Shams-El Ribeiqi (45 km.); El Ribeiqi-Gebel Iweibid (41·5 km.); and Gebel Iweibid-Suez junction (km. 41·8), each of which is operated by electric staff, and controlled by fixed signals. Each intermediate station is provided with a short crossing loop and up and down refuge sidings, and with a short siding for the storage of a water tank or defective wagon.

Owing to the great length of the block sections, the gangers' trolley control apparatus is being installed, which will not only make it possible and safe for a ganger's trolley to enter one of the long sections without causing undue delay to traffic, but will also enable the driver or guard of a disabled train to communicate with the cabins on each side by telephone.

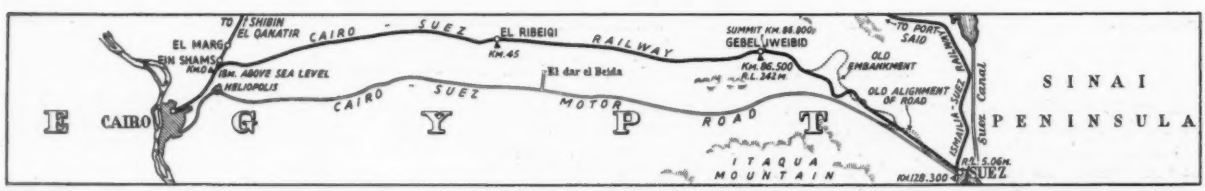
Conditions and Methods of Working

As will be seen from the gradient profile reproduced, the first section to El Ribeiqi forms one long steady rise; the middle section is nearly level, but has a rising tendency so that the summit of the line is at Gebel Iweibid station where it is 242 m. above sea level. There is a very severe climb in the opposite direction to this point from Suez junction, in which the line rises 237 m. in 41·8 km. The steepest grade is 1 in 100, and all goods trains have consequently to be banked between Suez and Gebel Iweibid. The new line was opened for goods traffic in December, 1934, and the present service consists of two trains daily, one in each direction.

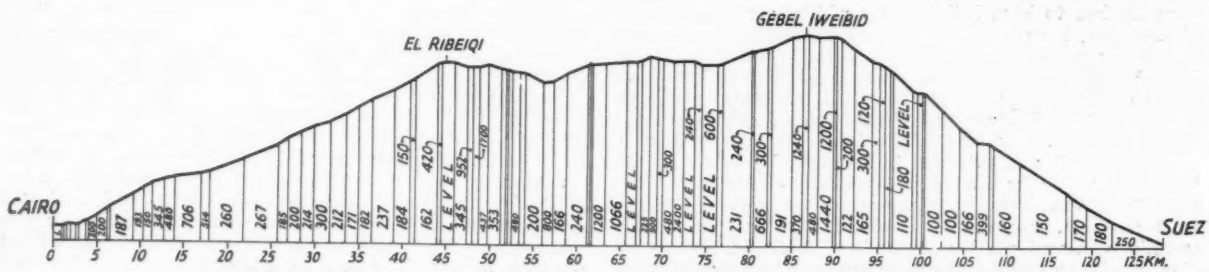
The first Ganz diesel railcars (now on order) to arrive in Egypt will be used to establish a passenger service between Cairo and Suez by this route. These railcars, of which five have been delivered, were fully described and illustrated in our *Diesel Railway Traction Supplement* of September 6.



The Cairo-Suez direct line in relation to the other main lines of the Egyptian State Railways

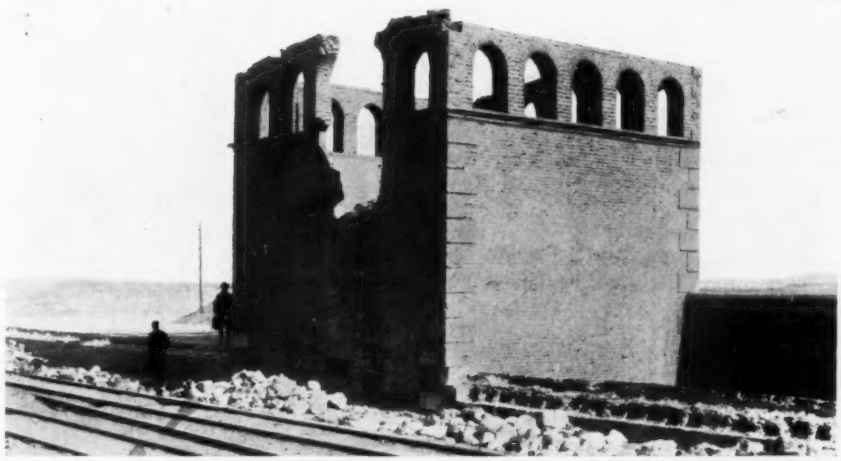


Sketch map of the reconstructed Cairo-Suez railway and the Cairo-Suez motor road

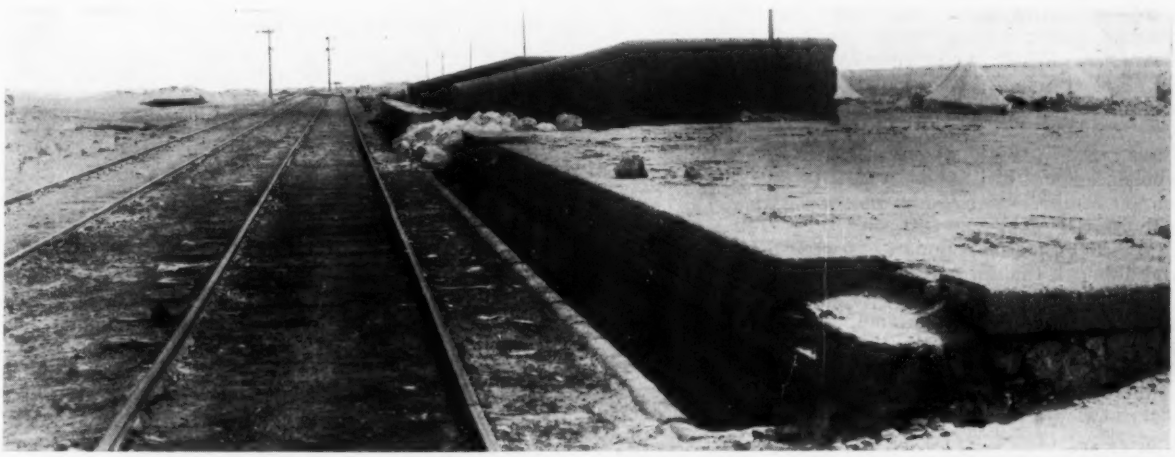


Gradient profile of reconstructed Cairo-Suez direct line, Egyptian State Railways

View of a typical length of line showing the old embankment



Old tower for water tank at Ribeigi station



The old station at Gebel Iweibed showing lineside trough in foreground and coal bin beyond

THE CAIRO-SUEZ DIRECT LINE, EGYPTIAN STATE RAILWAYS

(See article opposite, and leader on page 576)

XUM

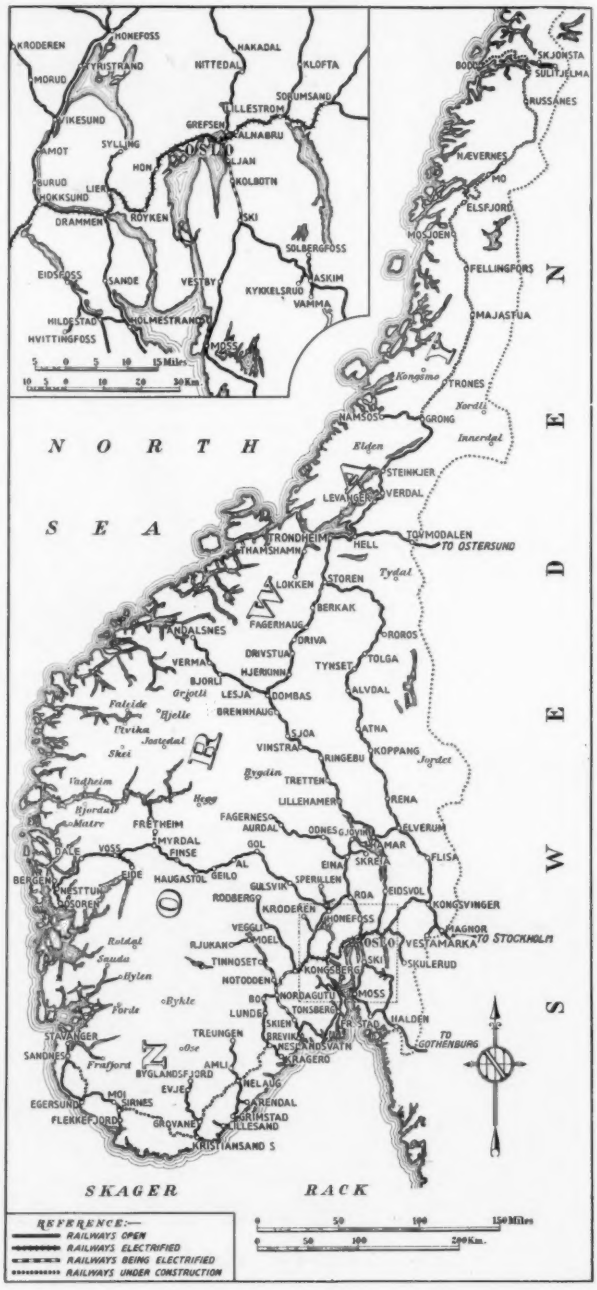
RAILWAY DEVELOPMENTS IN NORWAY

New lines, gauge conversion and electrification in progress

MORE progress is being made in railway construction at the present time in Norway, probably, than in any other Western European country. Two of the projects in course of execution are of considerable magnitude. North-east of Trondheim the existing railway to Grong, 136½ miles in length, from which a branch westwards to Namsös, 31½ miles long, was opened last year, is being extended to Mosjöen, a further 115¾ miles. Completion of this extension is not expected until 1942, and the subsequent intention is to carry this Nordland railway on to Bodö, a port which is just inside the Arctic Circle. This line, when complete, will greatly facilitate the transport of fresh and dried fish from the Lofoten Islands to the various European countries to which these products are exported. Of even greater importance is the Sörland Railway project, which is in a more advanced stage, for this will put Arendal and Kristiansand, and ultimately Stavanger also, in direct railway communication with the capital, whereas the only communication hitherto has been by water for the major part of the distance. The new line leaves the Kragerö branch, also of fairly recent construction, at Neslandsvatn, and strikes westwards, at right-angles to the line of the valleys running north and south, which has complicated the problem of construction from the engineering point of view. At Nelaug, the Arendal-Truengen line, a metre-gauge railway at present isolated from the Norwegian State system, will be crossed, and linked up with the new route; in preparation, the portion of the former from Nelaug to Arendal has been widened from metre to standard gauge, and through services between Oslo and Arendal are expected to come into operation during the present year. Completion through from Neslansvatn to Grovane, where the new line joins the existing Kristiansand-Byglandsfjord Railway (till now another isolated line) is planned for 1938, and involves the construction in all of 89½ miles of new track.

A beginning has been made with the even more difficult section from Kristiansand northwestwards to Sirnes, where the Flekkefjord-Stavanger Railway will be joined. This also is of metre gauge, and will require conversion to standard gauge before through services can operate to Stavanger. Where the existing line makes a diversion to the coast at Egersund, also, it is planned to build a cut-off route further inland, from Klungland to Algard, which will shorten the distance between Kristiansand and Stavanger. No date of completion is yet given for the whole scheme, but it is likely to have an important effect on communications between England and Norway, as it will make possible an express service from England to Oslo through the most populous part of Southern Norway, and although the rail journey will be some 60 miles longer than that from Bergen to Oslo, the difficulty of working over the summit level of 4,267 ft. near Finse will be avoided. Further, the new route will have the advantage of electric haulage over a certain proportion of its length, at the Oslo end. As with the London-Copenhagen service, via Harwich and Esbjerg since last May, the fast motorship *Venus* of the B. & N. Line may make possible an afternoon departure from London and an arrival in Oslo, via Stavanger, late the following evening, instead of on the second morning after departure.

The existing electrification out of the West station at Oslo extends as far as Kongsberg, a distance of 61½ miles, and this is now being carried on to Hjuksebö, and coupled with the electrification of the Bratsberg Railway from Notodden through Hjuksebö to Borgestad, beyond Skien. In addition to improving passenger services throughout this area, this electrification will greatly facilitate the transport to the sea of the products of the great Norsk hydro-



Outline map of the railways of Norway

electric works at Rjukan and Notodden. On the south side of Oslo, the main line to the Swedish frontier at Kornsjö is being doubled from Ljan (5 miles out of Oslo) to Ski (15 miles), and electrified, to give better service through the popular suburban area on the east side of Oslofjord. Improvements in the connection between the Oslo-Bergen main line and the Hardanger area have followed the opening last spring of the electrically-operated branch from Voss to Eide, on the Hardangerfjord, 17 miles distant. As mentioned in THE RAILWAY GAZETTE of January 4 last, the service between the same line and the Sogne region will also be facilitated by the completion in 1938 of the extremely difficult Flaamsdal Railway project, which is to conquer a difference in level of 2,840 ft. in a distance of 12½ miles, from Myrdal station down to Fretheim, on Aurlandsfjord, an arm of Sognefjord. The remarkable spiral tunnelling necessary in the initial stage of the line from Myrdal, even with so steep a gradient as 1 in 18, was illustrated on page 25 of the issue referred to.

Oslo-Bergen express approaching Finse in winter. The rotary snowplough has cleared the track to rail level, and the engine carries an additional V-shaped plough fixed to the buffer beam

Another important project, which, with those already mentioned, is being undertaken by the Norwegian State Railways as part of a very extensive scheme of public works decided on by the Norwegian Storting for the relief of unemployment, concerns the original main line to Skien, via Tönsberg and Larvik, which is still of 3 ft. 6 in. gauge. This is being converted to standard gauge, which involves dealing with 87½ miles of line, from the junction at Drammen with the later Kongsberg route to the point between Porsgrunn and Brevik where the Kongsberg line is rejoined. Plans are also in readiness for the extension of the East station at Oslo, which is used by the main line services to Sweden (both via Kornsjö to Gothenburg and via Charlottenburg to Stockholm), to Trondheim, and to Gjövik and Bergen; and on the completion of the Oslo-Ski electrification, all trains using this terminus will be electrically worked, except those on the Gjövik and Bergen directions, as electrical operation of the Stockholm and Trondheim services is already in operation as far as Lilleström, 13 miles out.

New steam locomotives have recently been built and will permit a considerable acceleration of the Oslo-Trondheim express trains, and all-steel rolling stock is being introduced into Norway for the first time. Hitherto steel stock has been avoided, as likely by increased weight to complicate the haulage problem over the extremely heavy gradients which are found on all the Norwegian main lines, but by careful design the new coaches will be no heavier than the existing wooden stock. For a country of but three million inhabitants, such railway enterprise is commendable, and shows considerable faith in the future of the railway.

Scene on the Bergen-Oslo Railway showing the line passing through snowsheds near Hallingskeid summit

NORTHERN IRELAND ROAD TRANSPORT BOARD.—No time has been lost by the Northern Ireland Road Transport Board in arranging for the acquisition of the smaller undertakings in Ulster. As we recorded last week, it began its operating life on October 1 with a fleet of 583 vehicles, of which 434 are buses and 149 lorries. Now arrangements have been made for taking over on November 1 the services of ten proprietors, namely, William E. Hobson, Dungannon; the Independent Bus Service, Limited, Belfast; the Imperial Bus Service, Belfast; Kane Brothers, Millisle; Joseph M'Cabe, Waringstown; Major M'Gown, M.C., Coleraine and Belfast; William Magee and Sons, Belfast; M'Faul Brothers, Larne; William Irvine and Son, Larne; and John M'Cartney, Newtownards.

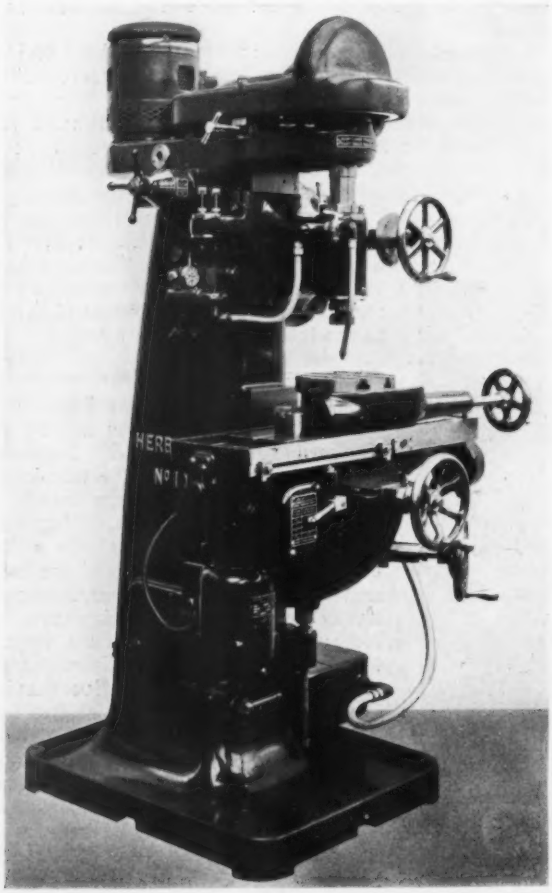
XUM

A NEW HERBERT VERTICAL MILLING MACHINE

The No. 10 pattern designed for machining numerous small and medium size parts

THE machine illustrated herewith has been designed to fill the demand that exists for a high class milling machine with self-contained electric drive for machining the numerous small and medium size parts that can best be dealt with by a vertical spindle. The machine can be supplied with alternative speed ranges, *viz.*, a slow range from 106 to 1,200 r.p.m. or a fast range from 260 to 3,000 r.p.m. The convenience of the operator has been given the greatest attention, all motions being controlled from the usual working position.

Having a table travel of 14 in., the machine is provided with an automatic longitudinal feed. The column is a rigid box casting well tapered outwards towards the base, which is of pan form and wide, giving great stability. It is machined on the top to take the driving box and has dovetail slides on its front face for the spindle head and knee. The driving box is bolted to the top of the column. It supports the vertical flanged motor at its rear end and contains the change speed and other gearing by which the pulley shaft behind the spindle is driven. Three changes of speed are given by the gearing, obtained through a pilot wheel and dial on the left hand side of the column. The drive from the pulley shaft to the spindle is by multiple vee belts; the pulleys are of unequal size and interchangeable, so that the number of spindle speeds given by the gear changes is doubled, six speeds in all being available. An idler is provided for maintaining the tension of the belts. This is moved into the position required and then clamped by the screw, with cross handle projecting from the left hand side of the driving box. The spindle speeds are marked on the dial in large figures which can be read from the front of the machine.

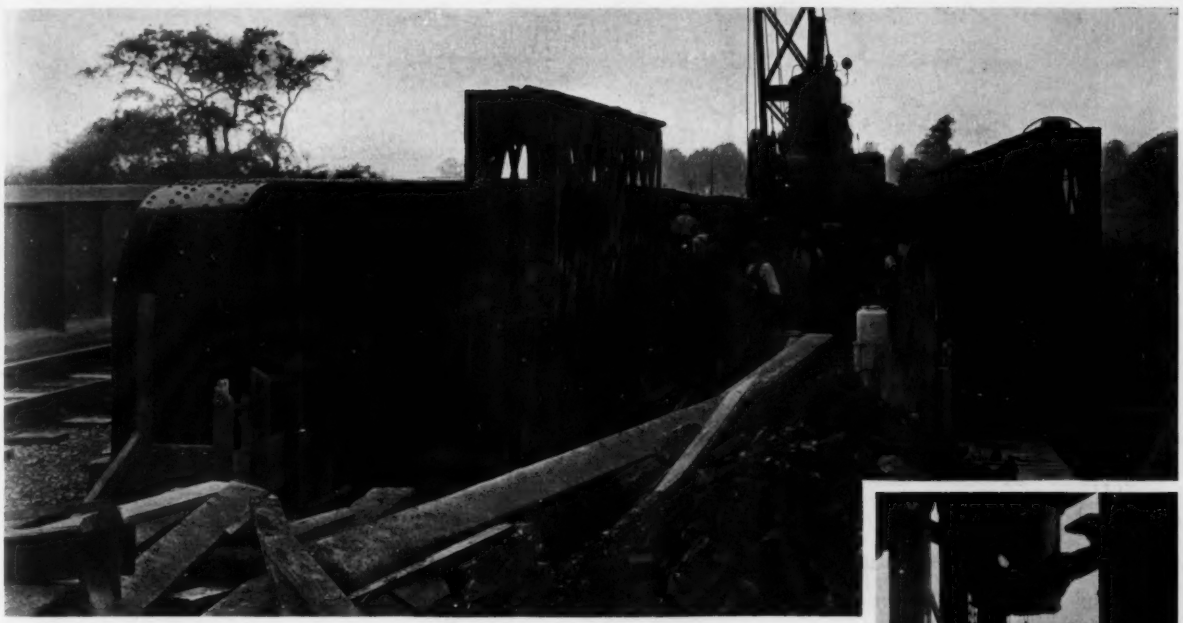


The gears in the driving box are of heat-treated nickel chrome steel, and the sliding gears are mounted on a multi-splined shaft of the same material. A pump in the driving box supplies oil to the gears, bearings and other mechanism. The spindle head is mounted on a slide on the front of the column, and is adjustable for wear by taper gib. The spindle is bored through and provided with a draw bolt, and the spindle head is counterbalanced by a weight inside the column, which makes its movement very sensitive. The knee is mounted on a slide on the front of the column, and is adjusted for wear by taper gib. The saddle slides on a dovetail guide on the knee, with an adjustable taper gib. It is moved by a screw and hand wheel, with adjustable graduated index disc, and can be clamped to the knee by a screw.

The table has a central tee-slot with side channels and end pockets. It works in a long guide on the saddle with taper gib. The automatic longitudinal feed to the table is driven by a small reversible flanged motor bolted to the underside of the saddle apron. The latter contains the reduction gearing and the pick-off gears by which the feed changes are obtained. The table has two adjustable stops, by which the feed in each direction is disengaged automatically. They also act as dead stops after the feed is tripped. Quick hand motion for the table is obtained by an enclosed internal gear and pinion at the right hand end. Ball bearings are used for this mechanism and for the feed screw, which ensures that the hand motion of the table is light and easy to operate. The switchgear is neatly enclosed in a recess near the top of the column on the right hand side.

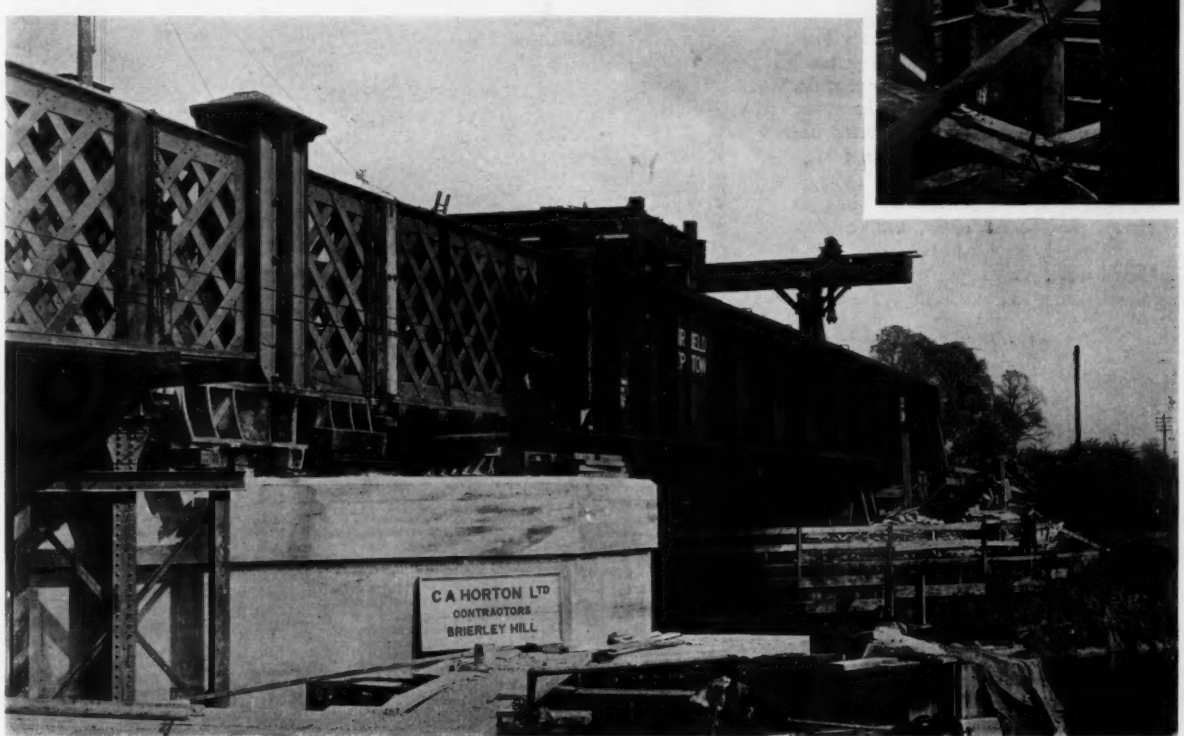
Feeding the Führers

The German State Railway had to perform some intensive haulage in connection with the National Socialist Party Congress at Nuremburg, which was held last month. Delegates arrived in 465 special trains, of which 196 were described as "trainloads of Political Leaders." We are told elsewhere that each train carried about 1,200 passengers, from which we calculate the number of such functionaries in Nuremburg to have been 235,200, in whose 470,400 hands the future of the Third Reich would seem to be adequately assured. On this basis we notice that political leaders now exceed in quantity the number of bars of chocolate conveyed by the Reichsbahn to Nuremburg for the refreshment of last year's congress as a whole. These totalled 220,000, at which rate each leader would now have to content himself with 0·94 of a bar, leaving nothing for those in the earlier stages of political evolution. No doubt some equitable adjustment was made this year, and extended to augment last year's supply of 110,000 pieces of cheese, with precisely 110,000 portions of biscuit for their accommodation and digestion. Possibly we have been guilty of an over-estimate, but we have it on the Reichsbahn's own authority that the trainloads of political leaders exceeded those of the next most numerous class of delegate by 91.



Above: Cutting of old centre lattice girder by burning

Right: Cast-iron column being burnt into sections for removal. The girders meanwhile are carried on temporary steel trestles, part of one of which is seen on the left



Launching the up line, Bath end face girder, with its leading end hung from the cantilever built out from the ballasted wagon and running on a roller and rail on the top of the nearer old lattice girder. The hauling tackle can also be seen

REBUILDING AVON BRIDGE, MANGOTSFIELD–BATH BRANCH, L.M.S.R.

(*See editorial note on page 575*)

British Freight Rolling Stock

I—L.M.S.R. Containers

An exhibition of representative freight vehicles and containers from the four group companies was held earlier this year at Euston station, L.M.S.R., and in this series of illustrations, reproduced by courtesy of the companies concerned, we are presenting a similar survey of modern practice in pictorial form. The L.M.S.R. containers illustrated herewith are: a "travelling hod" for the conveyance of building materials, and adapted to be hoisted to the upper floors of buildings in course of construction; Type BY, a large covered container for general traffic; and Type D, a large open type for articles such as stoves, glass bottles, baths, and castings

RAILWAY NEWS SECTION

PERSONAL

Mr. Robert Holland-Martin, C.B., Chairman of the Southern Railway, has consented to be the President of The Railway Convalescent Homes for the year 1936.

Mr. W. Powell, who, as announced in THE RAILWAY GAZETTE of December 21 last, had then been appointed District Goods Manager, Newport,

Mr. W. Powell,
District Goods Manager, Newport, G.W.R., 1934-35

Great Western Railway, has retired from the railway on account of ill-health. He entered the service of the G.W.R. in the District Goods Manager's office at Cardiff in 1896, and, after acquiring experience in the various sections of that office, was appointed Chief Clerk in 1919. In the following year he was transferred to the Plymouth District, and after gaining outdoor experience, became Chief Clerk to the Exeter District Traffic Manager in 1924. In September, 1930, Mr. Powell was appointed Assistant District Goods Manager at Cardiff, which post he held until his promotion last December as District Goods Manager, Newport.

We regret to record the death, on October 5, of Mr. Arthur William Allen, who retired from the position of Mineral Manager, L.M.S.R., in June, 1926. Mr. Allen was born in 1861 and joined the Accountant's Department of the former Midland Railway at Derby in January, 1875. In December, 1892, he was transferred to the General Manager's Department, but, about four years later, was appointed Assistant Accountant. In June, 1904, however, he returned as Indoor Assistant to the General Manager. It was in January, 1915, that Mr. Allen was appointed Mineral Manager, the post he continued to hold under the L.M.S.R. after the amalgamation, and from which he retired in 1926. A year previously he had been awarded the O.B.E. in the Railway Centenary Honours.

G.W.R. Appointments

The directors of the G.W.R. have approved the following appointments:—

Mr. J. M. Wildsmith, Assistant Goods Manager, London, to be District Goods Manager, Newport, in succession to Mr. W. Powell, who has retired.

Mr. D. Hood, Assistant, Port Talbot Docks, to be Dredging Assistant to Chief Engineer, Cardiff Docks.

Mr. A. E. le Cheminant, Chief Clerk, District Goods Manager's Office, Liverpool, to be Assistant District Goods Manager, London.

Mr. H. E. Banks, Clerk, District Goods Manager's Office, Swansea, to be Chief Clerk, District Goods Manager's Office, Liverpool.

The Secretary of State for the Colonies has recently made the following appointments:—

Mr. J. W. Bulman, Locomotive Superintendent, Cyprus Government Railway, to be Superintendent (vice General Manager) of that system.

Mr. J. R. Roberts, Assistant Traffic Superintendent, Tanganyika Government Railways, to be Traffic Manager.

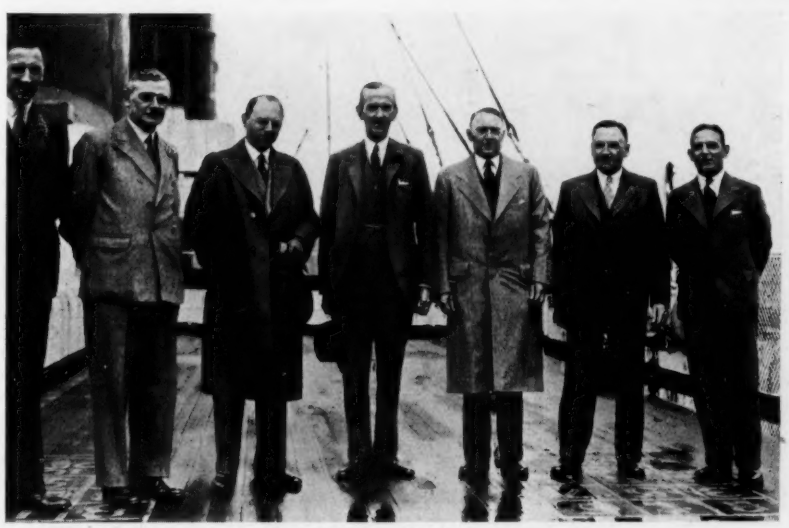
Mr. W. E. Williams, Assistant Stores Superintendent, Federated Malay States Railway, to be Stores Superintendent.

Mr. N. O. Fulton, late Chairman of Albion Motors Limited, whose death we recorded in our issue of August 2, left estate in Great Britain valued at £141,390.

Mr. H. Shelmerdine, who retired, in October, 1920, from the position of Architect and Surveyor to the Lancashire & Yorkshire Railway, and who died recently, left estate valued at £61,800 (£59,682 net).

We learn with regret of the death, on October 7, of Mr. James Peech, a Director of The United Steel Companies Limited, at the age of 62. Mr. Peech, who was the son of the late Mr. William Peech, one of the founders of Steel, Peech & Tozer Limited, was particularly well-known in railway circles and had travelled extensively on behalf of his firm, on railway business, in Canada, China, South Africa, Egypt and other countries. During the war he was Advisor on Shell Steel to the Ministry of Munitions, and was awarded the C.B.E. and a French decoration.

We regret to note the recent death of Mr. F. P. Gutelius, Vice-President of the Delaware and Hudson Railroad, at the age of 70. Mr. Gutelius had a notable railway career, first in various positions on the Canadian Pacific Railway, and, in 1912, was appointed



Left to right: Messrs. W. Marsh, W. J. England, J. B. Elliot, E. Gore Brown, E. J. Missenden, J. E. Sharp, and C. T. Pelly

Group of Southern Railway officers, who are visiting U.S.A. and Canada, photographed on the SS. "Berengaria" before sailing from Southampton on October 2

XUM

General Manager of the Canadian Government and later of the Intercolonial and Prince Edward Island Railways also. He became Vice-President (Operation & Traffic) of the Delaware and Hudson system in 1917 and in 1923 was made resident Vice-President in Montreal, the position he held until his death.

Mr. P. G. Corin, B.A., A.M.Inst.C.E., late Group Engineer of Imperial Chemical Industries (Fertiliser & Synthetic Products) Limited, has joined the staff of Henry Berry & Co. Ltd., as Technical Director. During the last 14 years Mr. Corin has been on the engineering staff engaged in the construction and operation of the nitrogen fixation plant and research on the coal oil and plastics at Billingham-on-Tees.

INDIAN RAILWAY STAFF CHANGES

Mr. A. B. Turner, Superintendent Rolling Stock, E.I.R., has been appointed to officiate as Divisional Superintendent, as from August 17.

Mr. W. H. H. Young has been appointed Chief Operating Superintendent, E.I.R., as from August 20.

Mr. W. H. Burnand, Chief Operating Superintendent, E.I.R., has been granted 20 months' leave preparatory to retirement, as from August 20.

Mr. J. D. Mollett, M.C., officiating Deputy Agent (Organisation), N.W.R., has been granted two months' leave as from August 1.

Mr. F. R. Hawkes, O.B.E., V.D., Chief Commercial Manager, N.W.R., has returned from leave. Mr. T. C. Hales, who was officiating for him, has reverted to his substantive appointment of Deputy Chief Commercial Manager.

Mr. A. Whitney, Signal Engineer, G.I.P.R., has been granted 6¾ months' leave, as from July 15.

Dr. Augustin de Vedia has been appointed President of the Board of Directors of the Argentine National Railway Pension Fund in succession to Dr. Hector Gonzalez Iramain, who resigned from the post on being elected National Senator for La Rioja.

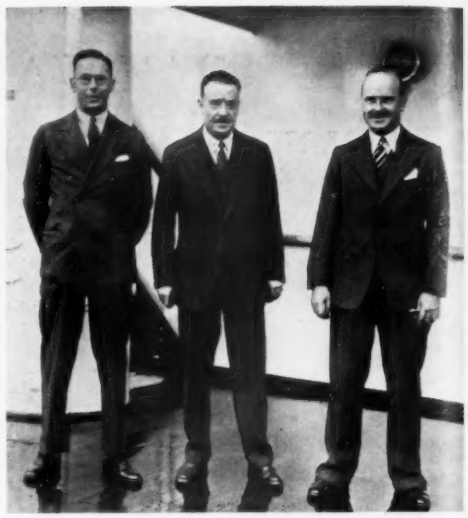
Sir Richard Redmayne, K.C.B., President of the Institution of Civil Engineers, accompanied by Lady Redmayne and their daughter, arrived in Buenos Aires on August 24. During his stay, he delivered several lectures before Argentine and British scientific societies. The party subsequently visited Uruguay, and sailed from Montevideo on their return to England on September 4.

Mr. W. A. Pickwoad, General Manager of the Antofagasta (Chili) & Bolivia Railway, has been appointed Director-General of Railway Transport during the demobilisation of the Chaco troops. Mr. Pickwoad has also been promoted by the President of the Republic from the grade of Commander to that of Grand Officer of the Order of the Condor of the Andes, being the first civilian to receive this honour.

We regret to record the death in Buenos Aires on September 2, of Mr. Clement Beaumont Ferry, A.M. Inst. C.E., District Engineer, Central Argentine Railway. Mr. Ferry, who was born in Exeter in 1876, was employed on the Central African and Shire Highlands Railways from 1902 to 1906. In March, 1909, he joined the Buenos Ayres & Pacific Railway, but resigned in the following August to take up an appointment in the Chief Engineer's Department of the Central Argentine Railway. There he was engaged on various important construction works and widening schemes, and was eventually appointed District Engineer at Venado Tuerto. During the war he served in the Royal Engineers with the rank of Lieutenant.

Cairn of native Selkirk stone which marks the spot at Craigellachie, B.C., where the last spike completing the Canadian Pacific Railway from ocean to ocean was driven on November 7, 1885. Sir Edward Beatty recently paid respects to the pioneer builders when he visited this spot

(see page 582)



Left to right: Mr. L. H. L. Lean, Brig.-Gen. F. D. Hammond, and Mr. J. F. M. Taylor

The Hammond Commission to China on board the Canadian Pacific Steamship "Empress of Britain" arriving at Southampton on October 3

The Hammond Commission

Brig. Gen. Hammond, with Messrs. Lean and Taylor, having duly presented his report to the Chinese Government, sailed for home on September 9 after a four-months' tour of the Chinese railways, and arrived at Southampton on October 3 (see illustration above). Our Shanghai correspondent writes that the report, which will not be published, at any rate at present, is believed to make general recommendations regarding railway organisation and suggestions for fuller railway communications to meet the growing needs of this vast country as a whole. In this connection it is of interest to recall that Sir Arthur Salter stated that the economic reconstruction programme in China should pay special attention to railway development, as railways still provided the cheapest and best means of transport for the agriculturist. Roadways and air routes could not, he said, adjust themselves to the actual economic conditions of the country as could railways.

Railcars for New Zealand

The introduction of railcars upon the New Zealand Government Railways, and their advantages, were outlined in the Overseas columns of the August 16 issue of THE RAILWAY GAZETTE this year. Further information concerning these cars is now available and is summarised below.

The first six cars, to be used on the Wellington-Masterton-Palmerston North service, will each seat 49 passengers and will have lavatory accommodation: one ton of parcels and luggage can also be carried. Power is provided by a 130-h.p. Leyland 10-litre six-cylinder petrol engine driving, through fluid gear and combined bevel and spur gear, the rear pair of wheels, this type of car, being single-ended for running one way only. A reverse gear is provided for shunting purposes. There are six wheels, the front end of the vehicle being carried on a four-wheel bogie and the rear supported by the single driving axle as shown in Fig. 1. The total weight fully loaded will be about 15 tons. Westinghouse air brakes are fitted, and at each side at the front of the car is an air-operated driver-controlled door: there are also emergency doors at the rear. Electric lighting and also heating, with hot air circulated by fans, are installed: special roof ventilation is arranged. The windows, which are of the half-drop type, are set in aluminium frames. The seats are of the tubular framed pattern, with chromium plating and foot rests. The floor is rubber covered and the exterior finish is in the N.Z.G.R. standard Midland lake, with aluminium roof. Except for the body panelling, which is of aluminium, the whole car is of steel construction.

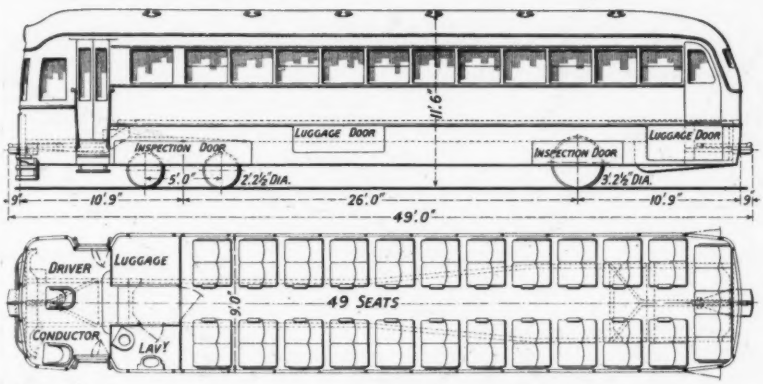


Fig. 1—Six-wheel, 130-h.p. Leyland engined car for the Wellington-Masterton-Palmerston North service

Wellington-New Plymouth Night Railcar Service

The Railways Board has also decided to use railcars for a night service between Wellington and New Plymouth. Three cars are required, but they will be heavier and of greater capacity than the earlier cars, as their construction is not subject to factors which have to be considered in operating traffic over the Rimutaka Incline. Each car will weigh 28 tons fully loaded, and will carry 56 passengers and up to 1 ton of luggage. Worked by two 10-litre engines the car will, it is claimed, be capable of 70 m.p.h. These cars will have smoking and non-smoking compartments, but otherwise, so far as the passengers are concerned, the equipment will be similar to that of the other cars. They will, however, have four-wheeled bogies at each end, and two pairs of driving wheels. Fig. 2 represents one of these cars, which, like the first six, are designed by Mr. P. R. Angus, the Locomotive Superintendent.

It has been decided to run railcars six nights a week (Sunday to Friday inclusive) in both directions, as soon as the vehicles, now on order, are available. Cars will leave Wellington at 11 p.m. and arrive New Plymouth at 6.32 a.m. (a total of 7½ hours for the journey), and from New Plymouth leaving at 10.48 p.m. and arriving Wellington 6.30 a.m. (approximately 7¾ hours for the journey). The present time by the day expresses averages 9¾ hours.

125-YEAR CELEBRATIONS OF HENSCHEL'S.—The well-known firm of locomotive builders, Henschel & Sohn A.G., Cassel, recently celebrated the 125th year of its existence. The proceedings opened with a torchlight procession of employees in the evening of Friday, September 27. The next day was declared a holiday, and the entire personnel assembled at the works for ceremonial celebrations. A special feature of the programme was the handing over of a 4-8-4 locomotive to representatives of the Chilean State Railway. The guests of honour, staff and workpeople assembled in about thirty rooms, to all of which the proceedings were broadcast.

CHANGE OF ADDRESS.—The Hull branch of Callender's Cable & Construction Co. Ltd., has moved from 21, Story Street, to premises at 11, Smeaton Street, Hull; the telephone number remains the same, namely, Central 31067.

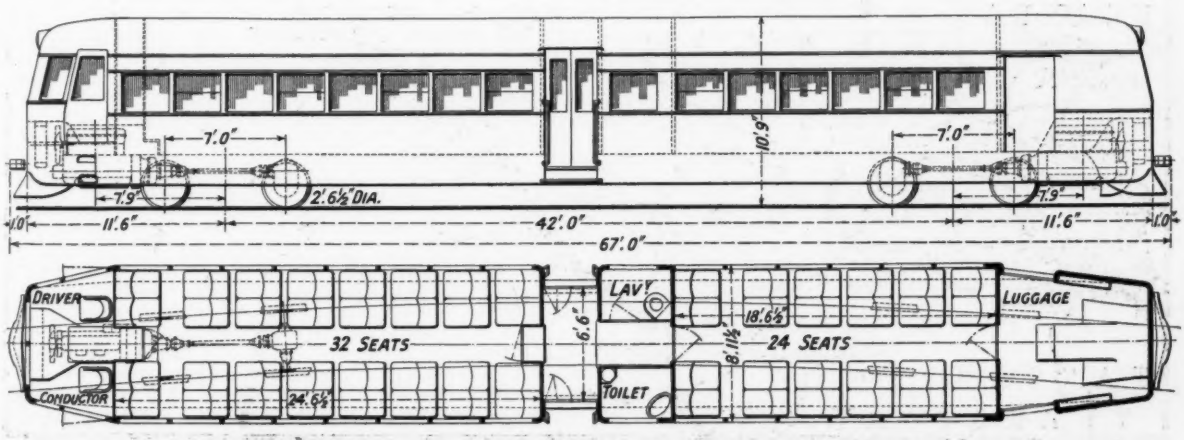


Fig. 2—260 h.p. car for the Wellington-New Plymouth night service

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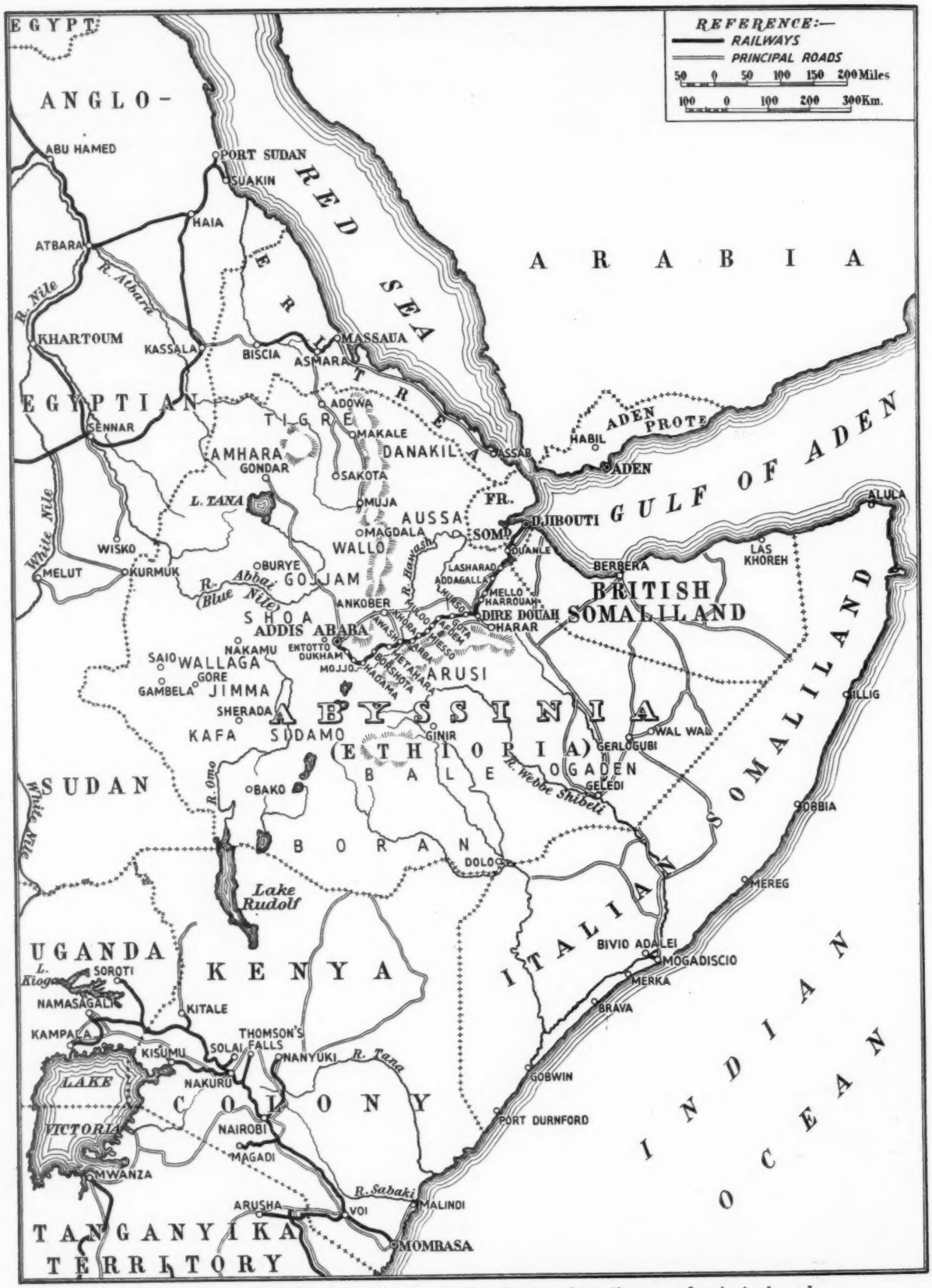

Map of Abyssinia and neighbouring territories showing the railways and principal roads

The Abyssinian Railway

A brief history and description of the C. de f. Franco-Ethiopien de Djibouti à Addis Abêda, the only railway in the country

In view of the fact that Abyssinia has now become the theatre of war, some account of its solitary railway may be of interest. The country has no seaboard of its own, its north-eastern frontier being separated from the Red Sea and the Gulf of Aden by Eritrea and French and British Somaliland. On this coastal strip is situated the French port of Djibouti, which is the nearest outlet to the sea for the Abyssinian capital, Addis Ababa, and is connected thereto by a railway. Certain of the following particulars of this line and the country it serves are abstracted from a recent article by M. J. G. Camut in *Renseignements Coloniaux*.

In 1896 France agreed to recognise the designation of Djibouti as the official port of Abyssinia, and from that year dates the conception of the railway joining Djibouti to Addis Ababa, the construction of which by France was officially recognised by Great Britain and Italy in the treaty of 1906. Two years before, by a contract dated March 9, 1894, the Emperor Menelik II had granted to M. Ilg a concession for a railway to be built in three sections: from Djibouti to Harar; Harar to Entotto, then capital of Abyssinia; and Entotto to the White Nile across the Kafa. The first section was to be built within two years of the date of the concession. With M. Chefneux, M. Ilg founded the Compagnie Impériale de Chemins de Fer Ethiopiens, and this company obtained the authorisation of the French Government to construct the first section of the railway from Djibouti to Harar across French Somaliland. Meanwhile preliminary studies on the route had shown that it would be extremely difficult to reach Harar, and the company obtained permission from the Abyssinian Emperor Menelik to fix its first provisional terminus at the place which has since become Dire Douah.

In October, 1897, work began at Djibouti and was continued across the rugged, desert country of French Somaliland towards Harar, but in the face of hostile tribes and a thousand other difficulties the Compagnie Impériale was unable to continue beyond Dire Douah, and it was not until the French Government had lent financial aid and a new company—the Compagnie de Chemin de fer Franco-Ethiopien de Djibouti à Addis-Abéda—had been formed that work could be resumed. Addis Ababa had now become the capital of Abyssinia and, as such, was to be the terminus under the new agreement.

In 1909 work was resumed, and by 1913, 93 miles (150 km.) of line had been constructed as far as Miesso. At the end of that year the steel bridge over the Hawash, 500 ft. long and 200 ft. above the river, was completed, and by the end of 1914, in spite of difficulties occasioned by mobilisation following the outbreak of the war, the line had reached Mojjo, 444 miles (715 km.) from Djibouti. In 1915 it attained to within a few miles of Addis Ababa, but, owing to delay on the part of the Government in handing over land, it was not until June, 1917, that the completed line, 487 miles (784 km.) in length, could be opened for traffic throughout. Since then numerous modifications have been effected; among these was the opening of the new station buildings at Addis Ababa in December, 1929.

Today Djibouti is an active little town with a population of several hundred Europeans and 15,000 natives. Leaving it, the railway runs across a desert region inhabited by the nomad, Somali and Issa tribes—whose only resource is the breeding of camel, sheep and goats and some cattle—until it reaches Dire Douah, 193 miles (311 km.) distant and 3,900 ft. in altitude. Dire Douah is a centre for the produce of the Harar and Tchercher provinces—mainly livestock, coffee, wax, cereals, butter and leather. Caravans also take back into the interior cotton goods, salt, sugar, paraffin, soap, building materials (corrugated iron, builders' hardware), ironmongery, wines, liqueurs, &c., brought in by the railway.

After Dire Douah the line leaves the Dankali desert and runs along the foot of the Tchercher mountains, the fertile valleys of which are inhabited by sedentary Galla peoples, and produce coffee and cereals; it then crosses, at the Col des Assabots (4,820 ft.) the massive spur running northwards from the main chain, that deflects the Hawash River in that direction.

From the Hawash to Addis Ababa, which stands at an altitude of 7,700 ft., the line climbs to attack the central plateau of Abyssinia, with its striking valleys, varied crops and vast horizons. Addis Ababa, the terminus of the line, is also the largest market. It was formerly a military camp of the Emperor Menelik, but has now become a large town, made more agreeable by the forest of eucalyptus trees which shades it. Goods brought up by railway are carried onwards into the interior to distances up to 250 miles or more by mule or camel caravans or by automobiles, as parts of certain tracks have recently been made passable to motor vehicles.

In return Addis Ababa receives from the Shoa, skins and cereals and some flour; from the Gore provinces and from Wallaga to the west, ivory, skins, wax, rubber, gold, and platinum; and from the Gojjam—around the sources of the Blue Nile where it leaves Lake Tana—skins. From the Jimma to the south-west, one of the richest provinces of Abyssinia and one of those in which most trade is done, as well as from the Kafa a wild province, are brought coffee, cattle skins, wax, civet and also the rare and much sought after black panther skins.

This 487-miles line is of metre gauge and, in its climb up from the coast, it rises to a height of over 8,000 ft. All rolling stock is fitted with automatic couplings, and only tender engines are used owing to the long distances between permanent sources of water supply. The company possesses the following rolling stock: 54 locomotives, 46 passenger coaches with seating for 2,706 passengers, 445 goods wagons. At first no night trains were run because of the depredations of native tribes, but since 1926 they have been run regularly except in the rainy season, when the track is liable to damage: there are four trains each way a day. The time taken by passenger train from Addis Ababa to Djibouti was formerly three days, but now some trains do the journey in 33 hr., and special trains have done it in 25 hr. Goods take up to five days. Mixed trains are usually run. The company has workshops at Dire Douah and depots at Djibouti, Dire Douah and Addis Ababa. Fares are cheap, particularly for natives—10 cm. a km. and 5 cm. around Addis Ababa. The first class ordinary fare from Djibouti to Addis Ababa is fr. 600.

The total cost of construction was 114 million francs. The number of passengers carried a year varies from 300,000 in 1929 to 120,000 in 1933, and the quantity of goods imported from 49,000 tons in 1929 to 30,000 tons in 1933; the quantity exported has been fairly steady, about 25,000 tons since 1925, rising to 27,800 tons in 1931. The company has a staff of 150 Europeans and 1,500 natives.

INDIAN RAILWAY CONFERENCE.—The Indian Railway Conference Association is at present holding its 33rd session at Simla, under the Presidency of Mr. J. C. Highet, Agent of the North Western Railway. Among the more important subjects being discussed are: reports from the Engineering, Mechanical, Electrical, Medical and Personnel Sections of the association; the revision of the general classification of goods; the consideration of the reports of the audit, and Accounts and Commercial Committees on means to prevent the fraudulent use of tickets; and a proposal to introduce through booking arrangements for parcels and goods traffic with the Ceylon Government Railways. Prior to the commencement of the conference, there were also meetings of the two interchange committees of the association, the Commercial and the Operating Committee.

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MINISTRY OF TRANSPORT ACCIDENT REPORT

Gourock, London Midland & Scottish Railway; June 16, 1935

This was the first accident report by Major G. R. S. Wilson, the new Inspecting Officer, to be published. It relates to a heavily-laden passenger train, on a Sunday morning, colliding, at about 4 or 5 m.p.h. with the buffer stops. Gourock No. 2 signal box is 452 yd., and Gourock No. 1 signal box 851 yd., from the buffer stops. The previous station is Fort Matilda, about 1¼ miles away. At a point 80 ft. from the buffer stop there is an indicator, at which, under local regulations, all trains must come to a stand in order that the whole of the stock shall be within the ticket-collecting barrier, which is situated 108 ft. along the platform so as to increase the somewhat restricted circulating area.

Driver Ross passed No. 1 box with the vacuum brake applied, at, he estimated, 10 or 12 m.p.h.; he had been running without steam from Fort Matilda, which he had passed at about 20 m.p.h., reducing the speed down a 1 in 108 gradient by means of the brake. Just after passing No. 1 box he released the brake, fearing to stop short, and did not make a further application until passing the platform ramp, 306 yards from the buffer stops; this was, however, only a partial application, and it was not until he was about two engine lengths from the buffer stops that he realised he was not going to stop clear. He then made a full brake application and reversed the engine by means of the steam reversing gear. He did not give the engine steam after passing Fort Matilda. He frankly admitted that the collision was due to his misjudgment in releasing and re-applying the brake, which, he said, was in perfect working order.

He stated that two or three years ago he had signed the route card applicable to the Gourock line and had re-initialled it at six-monthly intervals since. Although he was in possession of a copy of the appendix, he was unaware of the instructions relative to stopping the engine at the red indicator on No. 1 platform; furthermore, he was not clear in his mind as to the existence of a 10 m.p.h. speed restriction passing Gourock No. 2 box, although he did not think his actual speed at this point was any higher. Being on a "mineral" link, he did not work regularly into Gourock, but only on Sundays and at excursion times, though he had been there "pretty often," but not during the previous 12 months; he had only once been into No. 1 platform, more than 12 months ago. Notwithstanding this lack of recent experience, Ross was quite confident that his knowledge of the station and its approaches was sufficient to enable him to work passenger trains regularly into it. He heard no whistling from any of the station staff as he was running along the platform. Guard Mitchell, who was travelling in the brake compartment of the last vehicle but one, which was not fitted with a side look-out, knew the road well into Gourock; he did not, however, observe the signals approaching the station. Passing No. 1 box he applied the hand-brake in accordance with the usual practice when running into a terminal station; at the same time he noticed that 10 in. reduction of vacuum had been made, but did not observe the gauge after this. He remained at the hand-brake, screwing this down further as he entered the platform. He could give no estimate of speed approaching the station, but it did not occur to him that the train would be unable to pull up; the jar of the collision, which threw him against the van partition, took him completely unawares.

Signalman Wilson, of Gourock No. 2 box, considered the speed of the train passing his box to be higher than usual, certainly more than 10 m.p.h. He had on other occasions seen down trains go by his box as fast, but only "once in a while." He felt no alarm that the train would not be able to stop in time. Signalman W. Johnstone, of Gourock No. 1 box, however, thought there was nothing unusual about the speed of the train. Shunter Anderson was standing on No. 1 platform about 20 yd. from the ramp and was alarmed by the speed of the train as it passed No. 2 signal box. As the engine passed him he still thought the speed too high for the train to stop clear of the buffers, and consequently blew three blasts on his whistle to attract the driver's attention, but he could not be certain if he was heard. Just after the engine passed him he thought the brakes were lightly applied and there was no rebound after the impact, which, he considered, took place at a faster speed than he could walk. Station Foreman Tait was standing about 80 yd. along the platform from the buffer stops and first saw the train when it was rather more than half way along the platform. He knew at once that it was not going to stop with the coaches clear of the barrier, and therefore blew his whistle. As the train passed him he said it was going at such a speed that he would not have cared to board it. He thought the brakes were on. Ticket Collectors Magee and Watters were also concerned by the speed of the train during the last 50 or 60 yd. to the buffer stops. The former also blew the "brake whistle" (three blasts).

Major Wilson says that it is quite clear that this accident was primarily due to the misjudgment of Driver Ross, as indeed, he frankly admitted. Although he is of opinion that the driver's evidence as to speed was given in good faith, there is no doubt that he seriously under-estimated the speed at which he passed Gourock No. 2 signal box and approached the platform. Major Wilson adds that he observed that a speed of 15 to 20 m.p.h. for down trains at this point was quite normal, in spite of the 10 m.p.h. restriction. It is probable, therefore, that Ross's speed may have been as high as 25 m.p.h. passing No. 2 box and not much less just before he braked after passing Shunter Anderson, who, with others of the station staff, expressed concern at the speed. It is probable also that Ross failed to realise the appreciable reduction in brake power that would be occasioned by the weight of a full load of passengers.

In fairness to Ross, however, it must be recorded that his experience of Gourock Station was not recent, and by his own admission he was unaware of the special instructions relating to the speed restriction and the red *stop* indicator at No. 1 platform; this raises the question as to whether indeed his experience of the route was sufficient to justify his being booked for this duty. He himself was quite obviously under the impression that he had initialled the route card for this line, but Major Wilson was informed by the company's officers, who produced the actual card for his inspection, that this was not, in fact, the case.

The card, in accordance with the company's practice, is personal to a driver and contains spaces designated for the various routes for which the shed normally provides power. The spaces corresponding to routes known by a driver are initialled by him; the spaces for routes with which he is not acquainted are struck through in red ink. At the foot of the card spaces are provided for the six-monthly initialling by the driver, confirming that his knowledge of the routes already learned has not lapsed. If a fresh route is subsequently learned, a fresh card is made out and the old one destroyed. On Driver Ross's card the space applicable to the Gourock route was struck through in red ink, signifying that he was not competent to work into Gourock. It is evident, therefore, that he should not have been booked for this duty, but the fact remains that he was himself confident that his local knowledge was sufficient to work passenger trains over this route, in spite of a lack of recent experience, and there is no doubt that he would have initialled for this route had he been asked to do so. It appears, therefore, that supervision of the rostering at his shed in relation to knowledge of routes was not altogether satisfactory, and the company is taking active measures to rectify this.

Guard Mitchell cannot escape some criticism. Although he applied the hand brake, which, apparently, was a somewhat perfunctory action, he was by his own evidence unaware of anything abnormal until the actual impact. He had long experience as a passenger guard and had frequently and lately worked into this station; had he been more alert he would have noticed that the speed was higher than usual, which should have led him to apply the con-

tinuous brake, probably in sufficient time to avert the collision. By his lack of alertness he did not, in fact, give the driver the assistance to which the latter is entitled from his guard when entering a somewhat difficult terminal platform. On the other hand, it should be recorded that Shunter Anderson and the platform staff acted promptly in their endeavours to attract the attention of the driver, unfortunately without success.

Apart from the more obvious necessity of ensuring that before a driver is booked for a duty he has duly initialled the appropriate space on his card, it is necessary to guard against over-confidence which may lead a driver to initial a route of which he may have imperfect knowledge. Individual characteristics must vary widely in this respect, both as to a man's ability to learn a route quickly, and his power to assess his own knowledge with a view to confirmation by initials on the card.

Obviously close supervision is therefore required of the working of the route card system, on which safety must largely depend, in order to ensure that a driver has worked over a route often, and recently enough to justify his initials on the card, quite apart from his own readiness, which will vary according to temperament, to confirm his experience by this means. It is understood that this point is receiving the attention of the company.

The 10 m.p.h. speed restriction passing No. 2 box at Gourock is one that is usual and necessary when approaching a terminal station, but lack of strict observance, which Major Wilson noted here was common, detracts from its value as a safeguard. In future this restriction will be strictly enforced.

Entrance to No. 1 platform undoubtedly requires care; the existence of a screen wall on the left-hand side of No. 1 platform for an entering train, combined with the sharp left-hand curvature, introduces an element of difficulty for the driver on account of the restricted view from the footplate. The question was therefore raised as to whether this screen was in fact, really necessary, but Major Wilson was assured that the winter weather conditions at Gourock made it indispensable. Furthermore, its removal, though improving view, would not extend this right up to the buffer stops on account of a carriage siding, frequently occupied, on its other side, at 20 ft. centres from the platform track. Major Wilson does not think that the provision of any special form of shock-absorbing buffer stop is called for, no previous case of buffer-stop collision having been recorded here. In spite of the inherent difficulties of this platform, he is satisfied that strict observance of the 10 m.p.h. restriction approaching the station, coupled with the existence of an 80 ft. overrun beyond the red "stop" indicator, provide adequate safeguards.

The Sale of Passenger Transport

In giving the inaugural address on Monday last of a series of lectures to be delivered at the North Western Polytechnic, Mr. Ashton Davies, O.B.E., Chief Commercial Manager, L.M.S.R., said that the most successful salesman was the one who knew intimately the nature of his selling lines, the range of his market, and the power of human desire.

Dealing first with sales potentiality, he said that passenger transport fell into two classes. There was short distance traffic, largely composed of suburban traffic; and long distance travel, either for business or pleasure. Each type of travel was peculiarly sensitive to stimulation by a well-founded sales policy.

In 1934 the British railways carried almost 1,200,000,000 passengers, which produced gross receipts of £52,272,000. Based on the month of September, 1934, they carried each passenger 17¼ miles for an average fare of slightly over 11½d. Receipts from passenger traffic contributed about one-third of their total earnings. No figures existed of road passenger traffic if persons carried in the 1,300,000 private motor cars licensed in this country were included. The statistics of traffic handled by professional passenger transport during 1933 showed, however, that 5,418,000,000 passengers were carried, producing a gross receipt of £57,917,000, giving an average receipt per passenger carried of just over 2¼d. This did not include air services yet in their infancy.

In the case of rail versus road transport, there was a very large element of straight competition, influenced by the price factor alone, and in fixing fare levels, the management of either service had to recognise the line of demarcation existing between business which could conveniently be dealt with by rail or road, and business which ought to be left to a competitor. Competition, moreover, did not mean merely the attraction of traffic from one form of transport to another. On the contrary, it was the aim of the provider of transport to induce the public to spend in travel the maximum proportion of its surplus income. Novelty excursions, for instance, had proved themselves useful inducements.

Mr. Ashton Davies continued to show how the L.M.S.R. had endeavoured to provide its salesmen with the necessary knowledge of the measure of traffic of each class and type, and the volume carried within various zones of distance. The statistics prepared were, he believed, unique, and revealed the volume of each type of passenger traffic—ordinary, excursion, week-end, workmen, &c.—which passed within various mileage graduations. Much of this data had revealed circumstances and tendencies quite contrary to the then current opinion. It was a common belief that the railways had lost most of their former short distance passenger traffic owing to road competition. This statistical dissection, however, had revealed that quite a substantial proportion of the passenger business of the L.M.S.R. still consisted of really short distance traffic; in the summer period of 1934, for example, the number of passengers carried (excluding season ticket holders) for distances not exceeding 20 miles represented no less than 72 per cent. of the total passenger journeys, providing about one-fifth of the passenger receipts. These figures did not include revenue from season tickets, most of which were held for short distance travel.

The disquieting fact was the revelation that the railway's long distance business—though less vulnerable to road competition—was showing a distinct tendency to decline. This was due to impoverished spending power. Long distance traffic provided an important proportion of the passenger receipts. In the summer period, passenger journeys (excluding season tickets) over 100 miles produced nearly 43 per cent. of total passenger receipts, although they represented less than five per cent. of the total. The remedy in this case was the serious one of reducing the standard fare.

In discussing the effect of cheaper fares, Mr. Ashton Davies then continued to show that the number of passenger excursion journeys made on the L.M.S.R. had increased from 41,000,000 in 1923 to 173,000,000 in 1934. This intensification of excursion policy had resulted in the ordinary bookings declining from 152,000,000 in 1923 to 20,000,000 in 1934. It was not to be supposed, however, that these figures represented simple transfers of traffic from one category to another. Much of the excursion traffic was "created."

In considering the introduction of penny-a-mile fares, statistics showed that the L.M.S.R. alone would have to "cast bread upon the waters" to the extent of £1,500,000. A courageous policy, however, had resulted in success. Whereas the returns from 1929 to 1932 showed a decline of 18 per cent., representing £11,187,000, in total passenger receipts, those for the year 1934 showed an increase over 1932 of £1,363,000. This stimulating effect was most clearly reflected in long distance travel. Comparing August, 1934, with August, 1932, traffic under 100 miles showed an increase of 10 per cent., and over 100 miles 31 per cent. Before the price per unit was depressed it had to be ascertained that the lower price would attract additional revenue sufficient to cover any extra working expenses. As an example, he quoted the fact that, although L.M.S.R. earnings per train mile had been depressed by six per cent. and the mileage run increased

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by 50 per cent., gross profits had increased by 28 per cent. Mr. Ashton Davies, in referring to the traffic created by holiday contract tickets, said that in the year of its introduction the L.M.S.R. sold 42,000, but last year the number had risen to 204,000.

Dealing with the technique of the salesman, he discussed the necessity of such characteristics as personality and pertinacity. On the L.M.S.R. there was a specially selected and trained corps of salesmen whose ideas were stimulated by means of lectures, and who were given the opportunity to ventilate their views and experiences at periodical conferences. From time to time headquarters called for a concentrated effort to be made to develop a specific feature, and very satisfactory results had invariably followed. An example was school excursions. In 1932 the L.M.S.R. carried 13,000 scholars and earned £3,000. In 1934 it carried 104,000 and earned £39,000. Not only had there been a great increase in the gross receipts, but the average fare had risen from about 4s. 7d. to 7s. 6d.

Staff co-operation was another powerful force employed in increasing revenue, and in this connection Mr. Ashton Davies showed the value of the recently instituted "quota" scheme under which they had fixed as their objective a certain measure of traffic receipts well in advance of the present earnings, but not too big to be beyond the reach of enthusiastic endeavour. Every station and every salesman was expected to contribute their quota, and actual results were published in league form, thus establishing the competitive spirit amongst the sales force.

However important the personal element might be in the selling of passenger transport, the greatest effect could be derived only from the written word of the poster or newspaper advertising. Experience had shown that in this class of publicity the ordinary excursion announcements in the daily and weekly press produced the greatest measure of result.

Recently a test was made of the patronage secured to one of the L.M.S.R. excursions in the North of England. Every passenger was asked individually to name the form of publicity which had caused him to take the trip. It was found that press advertising and press paragraphs were responsible for 80 per cent., posters accounted for 10 per cent., and handbills for the remaining 10 per cent.

MUSHROOMS IN DISUSED GERMAN TUNNELS.—In the German town of Ahrweiler mushrooms are being successfully cultivated in an unused municipal wine cellar. To provide work for the unemployed of the town it is now intended to convert to the same use several disused railway tunnels on the abandoned Ahrweiler and Biblar-Ahr line.

The Silver Jubilee in Service

The first week's working of the new Silver Jubilee service on the L.N.E.R. has been conducted with entire success, the train having been to time or before time on every trip, save the first journey from London to Newcastle, on which there was a loss of 2¼ min. to Darlington, owing to the enforcement of a special speed limit of 70 m.p.h. north of York. The train also lost a minute between Darlington and Newcastle, and arrived on Tyneside between 2 and 3 min. late. But since then the running has been adjusted in such a way to allow of this reduced speed over the North Eastern Area, and time has been maintained without difficulty. Reference was made in the last issue to the remarkable uniformity of running which has already been developed by the engine-crews concerned, notwithstanding the new type of engine and the novelty of the schedule. In the opposite column the passing times at stations on the two runs referred to—the up journeys of September 30 (the first day) and October 2—are tabulated; their striking similarity, with no difference exceeding 67 sec., is immediately apparent. Note should also be taken of the high speeds maintained by *Silver Link* on adverse gradients, and of the ability shown by the engine to accelerate with great rapidity from the start and from points where speed is restricted.

By reason of the speed restriction between Darlington and York, it will be seen that there was a loss of time on the two runs reaching a maximum of 3¾ and 3 min. respectively at York. No attempt was made to regain the arrears until Southern Area metals had been reached at Shaftholme Junction, but from there onwards the recovery was rapid, the train being on or before time at Grantham on both journeys, 2 min. early at Peterborough, and 3½ and 4¼ min. early at Hitchin, after which easier running was made on to the terminus. This was typical of every up journey in the first week. Taking the run of October 2 in detail, the engine accelerated to 65 m.p.h. in 2½ miles from the Darlington start, and went up the 1 in 391 to Eryholme at a speed gradually increasing to 72½ m.p.h. Between there and York speed was allowed to rise to 77½ m.p.h. at Cowton and Otterington, but fell to 65 at Northallerton, and was maintained mostly at 71½ between Thirsk and York. After the dead slowing through York, the driver eased his engine over the facing junction at Chaloner's Whin, and then rapidly accelerated to 64 m.p.h. at Naburn, and 83½ at Riccall, before slowing to 25 m.p.h. for Selby curve and swing-bridge. On the level from Heck to Balne speed rose again to 80½ m.p.h., but the engine was again eased, for Shaftholme Junction, and slowed to 65 m.p.h. through Doncaster. It was from here onwards that *Silver Link* was allowed to run freely, and the running was of a very interesting description.

On the 2½ level miles to Rossington, speed rose to 76½ m.p.h., and a minimum of 70½ was maintained up the 2½ miles at 1 in 198 to Piper's Wood. The subsequent descent produced an acceleration to 83½ m.p.h.; speed then fell gradually to 74 m.p.h. on the easy rise to Retford, but not below 71½ m.p.h. on the 3¼ miles at 1 in 178-200 up to Markham summit. Down to the Trent valley there was a maximum rate of 85 m.p.h., and this had been allowed to fall away on the level to 71½ m.p.h. (as compared with 81½ m.p.h. on September 30) when Newark was passed. The engine was now opened out, and on rising grades, largely 1 in 300 and 330, accelerated to 79 m.p.h. at Claypole; after some miles at 1 in 550 and 300 up to Hougham the speed was 74 m.p.h., and the minimum rate on the 2 miles at 1 in 200 to Peascliffe tunnel was 66 m.p.h. The short level

L.N.E.R. SILVER JUBILEE, DARLINGTON–LONDON.
Engine: 3-cyl. 4-6-2 No. 2509, *Silver Link*
Load: 220 tons tare, 230 tons full.

Distance		Sched.	Sept. 30.	Oct. 2.
miles.		min.	min. sec.	min. sec.
0·0	DARLINGTON dep.	0	0 00	0 00
5·2	*Eryholme* pass	6	6 24	6 05
10·4	Danby Wiske ,,	—	10 41	10 10
14·1	NORTHALLERTON ,,	13	13 57	13 28
21·9	THIRSK ,,	19	20 38	19 42
28·0	Pilmoor ,,	—	25 55	25 03
32·9	Alne ,,	27	30 05	29 03
38·6	Beningbrough ,,	—	34 52	33 45
44·1	YORK¶ ,,	37	40 41	39 57
48·3	Naburn ,,	—	45 40	45 18
53·8	Reccall ,,	—	49 48	49 29
57·9	SELBY¶ ,,	51	53 58	53 42
62·5	Templehirst ,,	—	58 41	58 41
66·3	Balne ,,	—	61 36	61 36
72·1	*Shaftholme Jc.* ,,	63	66 15	66 07
76·3	DONCASTER* ,,	67	69 38	69 47
81·0	Rossington ,,	—	73 16	73 42
84·6	Bawtry ,,	—	76 14	76 38
88·4	Ranskill ,,	—	79 06	79 29
93·7	RETFORD ,,	81	83 20	83 47
98·6	*Markham* ,,	—	87 23	87 52
105·9	Carlton ,,	—	92 54	93 21
112·2	NEWARK ,,	97	97 47	98 18
116·9	Claypole ,,	—	101 13	102 12
122·6	Barkston ,,	—	105 41	106 38
126·8	GRANTHAM ,,	110	109 18	110 17
132·2	*Stoke* ,,	—	113 50	114 41
135·2	Corby ,,	—	116 11	117 00
140·1	Little Bytham ,,	—	119 38	120 22
143·7	Essendine ,,	—	122 01	122 42
147·5	Fallington ,,	—	124 41	125 13
152·8	*Werrington Jc.** ,,	—	128 37	128 48
155·9	PETERBOROUGH* ,,	134	131 57	132 07
159·7	Yaxley ,,	—	136 29	136 40
162·9	Holme ,,	—	138 48	139 01
168·8	Abbot's Ripton ,,	—	143 03	143 12
173·4	HUNTINGDON ,,	150	146 42	146 50
176·3	Offord* ,,	—	148 55	149 08
180·6	St. Neot's ,,	—	152 23	152 19
184·8	Tempsford ,,	—	155 23	155 17
188·2	Sandy ,,	—	157 46	157 40
191·2	Biggleswade ,,	—	159 59	159 51
195·3	Arlesey ,,	—	163 18	162 57
200·4	HITCHIN ,,	171	167 27	166 47
203·7	Stevenage ,,	—	170 25	169 37
207·3	Knebworth ,,	—	173 08	172 29
210·3	Welwyn North ,,	—	175 26	174 51
214·6	HATFIELD ,,	182	178 39	178 01
219·6	Potter's Bar ,,	—	183 05	182 18
223·1	New Barnet ,,	—	186 11	185 26
227·3	Wood Green ,,	—	189 18	188 33
229·8	FINSBURY PARK ,,	—	191 38	190 51
232·3	KING'S CROSS arr.	198	195 51	195 08

¶ Service slack, severe. *Service slack, slight.

strip to Grantham resulted in an acceleration to 76½ m.p.h., and the next 5 miles to Stoke summit, unbrokenly up at 1 in 200, witnessed no greater variation in speed than a fall from 76½ to 71½ m.p.h. Down the long descent from Stoke to Werrington junction speed ruled high, the 15·2 miles from Corby to Helpston being covered at an average of exactly 90 m.p.h., with a maximum of 94 m.p.h. sustained for some distance past Little Bytham. Speed was reduced to take water at Werrington, and the usual speed restriction was carefully observed through Peterborough.

From Peterborough the line rises to cross the Nene, is then level to Yaxley, and after a brief fall at 1 in 264-150 (1 mile) continues level to Connington, 9 miles from Peterborough. Here there was a rapid acceleration to 90 m.p.h., well sustained, which enabled the engine to "rush" the 4½ miles at 1 in 200 past Abbot's Ripton without speed falling below 74 m.p.h. Huntingdon was passed at 83½ m.p.h., and speed was then slightly reduced for the Offord curves, but recovered to 80½ m.p.h. and then fell to 76½ m.p.h. up the 1 in 579-200 to St. Neot's. From here over the undulating stretch to Arlesey the rate varied between 80½ and 88 m.p.h. unbrokenly. The next 8½ miles are rising, first for 2¼ miles at 1 in 400, then for 1¼ miles at 1 in 264, and finally for 5 miles at 1 in 200 to Stevenage, where the minimum speed was 70½ m.p.h. Speed rose to 88 m.p.h. before Hatfield, but as the train was now 4 min. early, the engine was allowed to run gently up to Potter's Bar, with a minimum of 65 m.p.h., and on the final descent to King's Cross there was no speed higher than 83½ m.p.h. From such details as these it is clear that in normal running the engine has an ample margin of time in hand to offset delays from permanent way relaying, or from other causes, except, of course, fog delays. The freedom from signal delays on the runs already made reflects great credit on the operating staffs of both the Southern and North Eastern Areas of the L.N.E.R.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 40th Week			Totals to Date		
	1935	1934	Inc. or Dec.	1935	1934	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,925¼ mls.)						
Passenger-train traffic	466,000	457,000	+ 9,000	19,989,000	19,595,000	+ 394,000
Merchandise, &c.	486,000	472,000	+ 14,000	17,790,000	17,674,000	+ 116,000
Coal and coke	232,000	218,000	+ 14,000	9,006,000	8,986,000	+ 20,000
Goods-train traffic	718,000	690,000	+ 28,000	26,796,000	26,660,000	+ 136,000
Total receipts	1,184,000	1,147,000	+ 37,000	46,785,000	46,255,000	+ 530,000
L.N.E.R. (6,336 mls.)						
Passenger-train traffic	305,000	292,000	+ 13,000	12,999,000	12,708,000	+ 291,000
Merchandise, &c.	332,000	335,000	− 3,000	12,272,000	12,336,000	− 64,000
Coal and coke	224,000	216,000	+ 8,000	8,758,000	9,001,000	− 243,000
Goods-train traffic	556,000	551,000	+ 5,000	21,030,000	21,337,000	− 307,000
Total receipts	861,000	843,000	+ 18,000	34,029,000	34,045,000	− 16,000
G.W.R. (3,749¼ mls.)						
Passenger-train traffic	191,000	181,000	+ 10,000	8,481,000	8,335,000	+ 146,000
Merchandise, &c.	192,000	192,000	—	7,183,000	7,138,000	+ 45,000
Coal and coke	100,000	98,000	+ 2,000	3,887,000	3,975,000	− 88,000
Goods-train traffic	292,000	290,000	+ 2,000	11,070,000	11,113,000	− 43,000
Total receipts	483,000	471,000	+ 12,000	19,551,000	19,448,000	+ 103,000
S.R. (2,171 mls.)						
Passenger-train traffic	283,000	272,000	+ 11,000	12,371,000	12,030,000	+ 341,000
Merchandise, &c.	58,500	57,000	+ 1,500	2,431,500	2,583,500	− 152,000
Coal and coke	24,500	20,000	+ 4,500	1,168,500	1,220,500	− 52,000
Goods-train traffic	83,000	77,000	+ 6,000	3,600,000	3,804,000	− 204,000
Total receipts	366,000	349,000	+ 17,000	15,971,000	15,834,000	+ 137,000
Liverpool Overhead (6½ mls.)	1,163	1,028	+ 135	47,784	45,969	+ 1,815
Mersey (4½ mls.)	4,339	4,273	+ 66	160,480	162,892	− 2,412
*London Passenger Transport Board	555,100	552,600	+ 2,500	7,566,800	7,461,600	+ 105,200
IRELAND						
Belfast & C.D. pass. (80 mls.)	2,132	2,069	+ 63	106,872	105,674	+ 1,198
,, ,, goods	444	533	− 89	19,893	20,451	− 558
,, ,, total	2,576	2,602	− 26	126,765	126,125	+ 640
Great Northern pass. (543 mls.)	10,450	10,700	− 250	437,100	414,850	+ 22,250
,, ,, goods	11,650	10,000	+ 1,650	364,050	345,250	+ 18,800
,, ,, total	22,100	20,700	+ 1,400	801,150	760,100	+ 41,050
Great Southern pass. (2,124 mls.)	26,043	27,348	− 1,305	1,022,943	995,870	+ 27,073
,, ,, goods	43,671	41,018	+ 2,653	1,367,913	1,287,023	+ 80,890
,, ,, total	69,714	68,366	+ 1,348	2,390,856	2,282,893	+ 107,963

* 14th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices Oct. 9, 1935	Prices Rise/Fall
G.W.R.				
Cons. Ord.	66½	48½	46	+½
5% Con. Prefce.	118	109	109½	−1
5% Red. Pref. (1950)	115	107	108½	...
4% Deb.	117	105	109½	—
4½% Deb.	119	109	111½	—
4½% Deb.	129½	115¼	119½	—
5% Deb.	135	126¼	132½	—
2½% Deb.	75	64	69½	−2½
5% Rt. Charge	134 7/16	123¼	129½	—
5% Cons. Guar.	132 5/4	121¾	123½	+1
L.M.S.R.				
Ord.	30½	19½	17½	+½
4% Prefce. (1923)	64¼	41	49	+½
4% Prefce.	87	69½	77½	+1
5% Red. Pref. (1955)	107	92½	98½	−1
4% Deb.	114 1/8	100½	102	+½
5% Red. Deb. (1952)	118 11/16	111¼	114½	—
4% Guar.	106½	96¾	98	—
L.N.E.R.				
5% Pref. Ord.	24¾	13½	9½	+½
Def. Ord.	11½	6 7/8	5¼	+¼
4% First Prefce.	76	59½	50	−1
4% Second Prefce.	47	25½	19½	+1
5% Red. Pref. (1955)	94½	80	72½	−½
4% First Guar.	104	92	95½	—
4% Second Guar.	97 7/8	86½	84½	−½
3% Deb.	90	74½	76	−½
4% Deb.	114	99¼	100½	−½
5% Red. Deb. (1947)	117	108	109½	—
4½% Sinking Fund Red. Deb.	111¼	105¼	109	—
SOUTHERN				
Pref. Ord.	90	63 1/8	73	—
Def. Ord.	32 5/8	19	18½	+1
5% Prefce.	118 5/16	107½	110½	—
5% Red. Pref. (1964)	115¾	107½	109½	−1
5% Guar. Prefce.	132	120¾	122½	−1
5% Red. Guar. Pref. (1957)	119½	113	113½	—
4% Deb.	116½	103¼	108	−½
5% Deb.	134	124 13/16	131½	−1
4% Red. Deb. 1962–67	113 11/16	105 9/16	107½	−1
BELFAST & C.D.				
Ord.	6	5	8½	—
FORTH BRIDGE				
4% Deb.	110	100	105½	—
4% Guar.	110	100	104½	—
G. NORTHERN (IRELAND)				
Ord.	9¾	4 15/16	15½	—
G. SOUTHERN (IRELAND)				
Ord.	25	12½	40½	—
Prefce.	21½	13 16/16	41½	−½
Guar.	48	39	79¼	+¼
Deb.	67	59	79 4	−½
L.P.T.B.				
4½% "A"	126	115	120½	−1
5% "A"	135½	124½	130½	−1
4½% "T.F.A."	113½	107½	109	—
5% "B"	131¾	118	125½	−1
"C"	97	73	98*	−3
MERSEY				
Ord.	15¼	7	11	—
4% Perp. Deb.	93½	82½	94½	—
3% Perp. Deb.	66½	61½	70½	—
3% Perp. Prefce.	54	44½	52½	+4

* ex dividend

XUM

NOTES AND NEWS

"The Railway Gazette" Telephone Number.—The telephone number of the editorial, advertising, and publishing offices of THE RAILWAY GAZETTE has been changed to Whitehall 9233 (6 lines).

Retired Railway Officers' Society.—The autumn luncheon of the Retired Railway Officers' Society will be held on Tuesday, November 5, at the Great Eastern Hotel, Liverpool Street station. Sir Follett Holt, K.B.E., Chairman, Buenos Ayres Great Southern Railway, Buenos Ayres Western, and Entre Rios Railways Company, &c., has promised to attend. Railway officers will be welcomed if introduced by a member.

R.A.S. Achievements.—Railway Air Services Limited announces that, with the conclusion of the summer services, its machines have now flown 500,000 miles on regular services. The bookings for the six months from January to June, 1935, were as heavy as the whole of 1934—May to December—and the carryings are more than 300 per cent. up on the figures for last year. Moreover, freight traffic has also shown a considerable increase.

Key West Railway may be Abandoned.—The severe September hurricane, which caused the death of nearly 500 persons in the Florida Keys, seriously damaged the "railway that goes to sea." This line runs some 64 miles on viaduct, across open water and a group of small islands, from the Florida mainland to Key West. The damage is estimated to cost £500,000 to repair, and the possibility of abandoning the line is understood to be under discussion.

Road Accidents.—The Ministry of Transport return for the week ended October 5, of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year :—

	Killed, including deaths resulting from previous accidents	Injured
England ...	107 (129)	3,926 (4,139)
Wales	8 (7)	159 (161)
Scotland ...	12 (8)	396 (406)
	127 (144)	4,481 (4,706)

The total fatalities for the previous week were 142, as compared with 130 for the corresponding period of last year.

French Electrification Opening.—Electrically-worked services over the Vierzon-Brive main line of the P.O.-Midi Railway began with the summer timetables on May 15 (see *Electric Railway Traction Supplement* for May 3), but the official opening ceremony did not take place until October 4, when a large party travelled down to Brive from Paris by electric train. On October 5 the new hydro-electric power station at Marèges, was officially opened by the Minister of Public Works, M. Laurent Eynac. This station supplies power to the new P.O.-Midi electrified extension, and is tied-in with the steam generating stations near Paris.

Benguela Railway.—Results for the second quarter of 1935 were :—Gross railway receipts, escudos 7,689,000.00 ; net railway receipts, escudos 2,589,000.00.

Winter Services on the Etat.—The winter train services which came into operation on October 6 on the French State Railways are notable mainly for the increased use of railcars, some of which, originally introduced to provide summer services, are being retained, and others used to replace ordinary trains normally withdrawn for the winter.

Haarlem-Zandvoort Electrification.—Electric traction was inaugurated on October 6 over the 8-km. Haarlem-Zandvoort branch of the Netherlands Railways. This coincided with the introduction of the winter timetable, in which the number of trains daily has been increased from 29 to 48, and the journey time reduced from 34 to 26 minutes. Through trains from Amsterdam to Zandvoort, a popular bathing resort, have been increased from 8 to 39.

Italian Electrification.—Electric services are now in operation between Florence and Chiusi on the Florence-Rome main line, and between Naples and Formia on the Naples-Rome line. These two divisions will be opened throughout to electric traction on October 28. On the private line from Rome to Ostia a new 1,200 h.p. electric train has been introduced. It consists of a locomotive, five ordinary cars, and a driving trailer, so that it has the advantages as to reversibility which are possessed by a multiple-unit train.

Agreed Charges.—Forty-four more applications for the approval of agreed charges have been lodged with the Railway Rates Tribunal, as will be seen from the legal notice published on page 610. These applications may be inspected at the office of the Tribunal, Bush House, Aldwych, London, W.C.2. A copy of each application (1s. post free) may be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, S.W.1. Notices of objection must be filed with the Registrar of the tribunal and a copy of each objection sent to Mr. Cole Deacon on or before October 29.

Railway Students' Association.—The first ordinary meeting of session 1935-36 will be held at the London School of Economics at 6 p.m. on Thursday, October 31, when Mr. T. W. D. Abell, of the Marine Department of the Southern Railway at Dover will deliver a lecture entitled "The Southern Railway Train Ferries." Mr. Abell is thoroughly conversant with the constructional details and operation of the ferries, which are the first to be built for passenger services between Britain and the Continent. The subject will be illustrated by lantern slides and films.

Railway Cottage Homes Fund.—On September 28, Major W. H. Carver, M.P., a Director of the L.N.E.R., opened twelve new bungalows at Cottingham, near Hull, which have been built by the Cottage Homes and Benefit Fund of the late North Eastern Railway. The fund now has 61 cottages in the Hull area, and the number built or authorised for the whole of the L.N.E.R. system is 331.

Nickel Plate Railroad.—It is announced from New York that the Nickel Plate Railroad has defaulted on $14,946,000 of maturing notes because of lack of funds. These form part of a Government loan made by the Reconstruction Finance Corporation subject to the condition of becoming immediately repayable in case of default, and it is suggested that this may lead to a receivership.

L.N.E.R. (N.E. Area) Federation of Lecture and Debating Societies. The first meeting for the current session was held at York on October 8. Mr. S. T. Burgoyne, Passenger Manager, North Eastern Area, L.N.E.R., presided, and a very large audience had the pleasure of hearing a lecture delivered by Mr. C. M. Jenkin Jones upon recollections and experiences of his recent visit to Palestine.

G.W.R. Royal Wedding Excursions.—The Great Western Railway announces that cheap bookings to London will be given from 500 stations on its system in connection with the wedding of the Duke of Gloucester and Lady Alice Scott on November 6. The majority of these will be available by regular services, but special trains will be run from Penzance and the West of England, Swansea, Cardiff and South Wales, and Birmingham and the Midlands.

Southern Railway "Fog-Phone" Service.—The Southern Railway announces that, in conjunction with the Post Office telephone authorities, it has improved on last winter's arrangements for notifying intending passengers about fog services. The new scheme has been arranged so that information of any departure from normal railway working caused by fog, ice, snow, &c., can be obtained at any time during the day or night from local telephone exchanges in the London telephone area. Last winter the scheme operated until 10 a.m. only. The arrangements cover all sections of the Southern Railway suburban services within the London telephone area.

Forthcoming Meetings

Oct. 17 (*Thurs.*)—**Dorada Railway Co. Ltd.** (Ordinary), Dashwood House, 69, Old Broad Street, E.C.2, at 2.30 p.m.

Oct. 17 (*Thurs.*)—**Central Argentine Railway Limited** (Ordinary General), River Plate House, Finsbury Circus, E.C., at 12.15 p.m.

CONTRACTS AND TENDERS

The L.M.S.R. has placed a contract with a London firm for alterations to the goods entrance at West Street ferry, Gravesend.

D. Wickham & Co. Ltd. has received an order from the Central Uruguay Railway for two petrol-driven inspection railcars.

The Horsehay Co. Ltd. has received an order from the Indian Stores Department for steelwork required for Mechna bridge reconstruction.

Wright, Pinhorn & Partners Limited has received an order from the Indian Stores Department for 95,000 steel bolts for C.I. sleepers at a total price of Rs. 17,327, free delivery Kalyan.

The Indian Stores Department has placed orders for electric lamps required for general and train lighting, and locomotive cab and headlights variously with the following firms: Philips Electrical Co. (India) Ltd.; Marker, Goldsteane & Co. Ltd.; General Electric Co. Ltd.; James Finlay & Co. Ltd.; Kaycee & Co. Ltd.; J. Stone & Co. (India) Ltd.; and the Bengal Electric Lamp Works Limited.

The Bengal-Nagpur Railway Administration has placed the following orders:

Charles Richards & Sons Ltd. (through Burn & Co. Ltd.): 1,018½ cwt. forged m.s. black hexagon bolts (total price Rs. 17,698) and 1,447 cwt. forged m.s. black nuts (total price Rs. 27,521).

The Vacuum Brake Co. Ltd. (through Heatly & Gresham Limited): 28,000 27-in. by 2-in. pipe hose (total price Rs. 51,333) and 27,575 indiarubber rings (total price Rs. 12,265).

The Westinghouse Brake & Saxby Signal Co. Ltd. (through Saxby & Farmer (India) Limited): 2,500 ¾-in. release valves (total price Rs. 13,997).

Ruberoid Co. Ltd. (through Plummer Bros. & Co. Ltd.): 1,020 rolls 72-ft. by 3-ft. by two-ply roofing and 816 cwt. compound carriage roofing (total price Rs. 17,289).

Soviet Orders in Great Britain

Orders placed in Great Britain by Soviet trading organisations in August of this year amounted to £703,748 as compared with £812,034 in August, 1934. In the first eight months of this year the orders placed and purchases made totalled £7,028,160 as compared with £6,652,319 in the corresponding period of 1934, an increase of 5·7 per cent. The following table shows the principal orders placed in the period under consideration for engineering and allied equipment and materials:—

	August, 1934	August, 1935	Jan.-Aug., 1934	Jan.-Aug. 1935
	£	£	£	£
Machinery and equipment ..	43,556	60,265	915,509	1,711,084
Ferrous alloys and steel ..	95,827	14,298	1,130,111	560,523
Non-ferrous metals ..	184,918	290,439	1,435,207	1,813,065
Rubber ..	240,450	94,548	1,660,840	571,046

The orders for machinery and equipment this year show a considerable increase over 1934, being almost double. On the other hand, purchases of ferrous alloys and steel are almost halved. Orders for non-ferrous metals show an increase by 26·3 per cent, and those for rubber have declined to about a third.

Greenwood & Batley Limited has received an order from the Great Western Railway for 280 train lighting dynamos, Leitner patent. This quantity of 280 is the largest single order for train lighting dynamos yet received by this firm.

Leyland Motors Limited has received the following orders from railway-associated road-transport operators:—Devon General Omnibus & Touring Co. Ltd., 10 Tigress passenger vehicle chassis, and Southdown Motor Services Limited, 12 Titan passenger vehicles, of which six will be oil-engined and fitted with torque converters, and three Cub passenger vehicles. The South African Railways & Harbours Administration has also ordered one Leyland Tiger vehicle.

Wagons required in India

Tenders are invited, receivable by November 1 at the office of the Director, Mechanical Engineering, Railway Board, New Delhi, for the construction in India of 10 I.R.S. BCR covered bogie wagons, 72 I.R.S. BVG goods brake vans and 44 I.R.S. all-steel motor vans for the broad gauge, and two I.R.S. MBVG goods brake vans for the metre gauge. These vehicles, without wheels and axles, are required for delivery between April 1, 1936, and March 31, 1937.

The South African Railways & Harbours Administration is calling for tenders, to be presented in South Africa by November 18, for the supply and delivery of a number of heavy section rail motor trolleys. Further particulars of this call for tenders may be obtained, by firms desirous of offering motor trolleys of United Kingdom manufacture, from the Department of Overseas Trade.

The Egyptian State Railways Administration is inviting fresh tenders forthwith through its London office for the supply of 300,000 tons of coal. This development follows news that, owing to the increase in freight rates, the Maris Export & Trading Company, Beynons, and Gueret Llewellyn desired to submit quotations on an f.o.b. instead of a c.i.f. basis. In reply to a call for tenders for 280,000 tons of coal, Maris Export had quoted 28s. 4d. a ton c.i.f., Beynons 28s. 7d. c.i.f., and Gueret Llewellyn 28s. 9d. c.i.f. The Egyptian State Railways Administration endeavoured to maintain the c.i.f. offers with the promise of larger orders, namely, for 120,000 tons from each firm, but the latter declined and withdrew their tenders, states a Reuters message from Cairo.

The U.S.S.R. State Ball Bearing Works No. 1 in Moscow, with an annual output capacity at present stated to be 24,000,000 bearings, is to be extended to a 50,000,000 output capacity. The new plant will produce 350 different types of bearings, and its main section is to supply three of the most important consumers: the automobile, aviation, and tractor industries. A special department will manufacture short series of various bearings for the benefit of industries demanding a greater variety. This section will produce yearly 5,000,000 bearings of 200 different types.

Tenders are invited by the Egyptian State Railways Administration, receivable in the Chief Inspecting Engineer's Office, London, S.W.1, for one 60-ton single-track wagon weighbridge.

Forthcoming Events

Oct. 11 (*Fri.*).—Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 7 p.m. Election of Sub-Committee.

Railway Club, at Royal Scottish Corporation Hall, Fetter Lane, London, E.C.4, 7.30 p.m. Lecture by Mr. H. W. Bardsley on some well-known British railway accidents.

Railway Students' Association (Edinburgh), at Goold Hall, St. Andrew Square, 7.30 p.m. Presidential Address by Mr. R. Gardiner.

Oct. 12 (*Sat.*).—Permanent Way Institution (Manchester-Liverpool), at Temperance Inst., Southport, 3 p.m. "With a Camera in the Sudan," by Mr. C. A. Greenwood.

Oct. 14 (*Mon.*).—Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 5.30 p.m. Opening Meeting and Presidential Address by Sir Cyril Hurcomb, K.B.E., C.B.

Oct. 15 (*Tues.*).—Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Railway Transport in the Dominions," by Mr. A. W. Arthurton.

Institution of Locomotive Engineers (Manchester), at Literary and Philosophical Society, 36, George Street. Presidential Address by Mr. A. C. Carr.

Oct. 16 (*Wed.*).—L.N.E.R. (Darlington) Lecture and Debating Society, at North Road Inst., 7.30 p.m. "As it Occurs to Me," by Mr. J. Eggleston.

Oct. 17 (*Thurs.*).—G.W.R. (London) Lecture and Debating Society, in General Meeting Room, Paddington Station, 5.45 p.m. "Commercial Air Transport," by Mr. G. O. Waters.

Institution of Locomotive Engineers (Scottish), at Royal Technical College, George Street, Glasgow, 7.30 p.m. "Recent Developments in the Steam Locomotive," by Mr. J. M. S. Dale.

Oct. 18 (*Fri.*).—Institution of Mechanical Engineers, at Connaught Rooms, Great Queen Street, London, W.C.2, 6.45 p.m. for 7.15 p.m. Annual Dinner.

L.N.E.R. (London) Lecture and Debating Society, at Dining Club Room, Liverpool Street Station, 5.45 p.m. Joint meeting with Permanent Way Institution (London). "Maintaining a London Suburban District," by Mr. T. H. Seaton.

Oct. 22 (*Tues.*).—Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. Inaugural Meeting and Address by the President, Sir Cyril Hurcomb, K.B.E., C.B.

L.N.E.R. (Newcastle and Sunderland) Lecture and Debating Society, at Sunderland, 7 p.m. "A Day in the (Passenger) Selling Department," by Mr. P. A. Harverson.

L.N.E.R. (York) Lecture and Debating Society, at Railway Inst., Queen Street, 7 p.m. "Nightless Days in Norway," by Mr. Cecil J. Allen.

Permanent Way Institution (Scottish), at Royal Technical College, George Street, Glasgow, 7.15 p.m. "Measured Shovel Packing in Permanent Way Maintenance," by Mr. G. K. Kent.

Oct. 24 (*Thurs.*).—Institution of Electrical Engineers, Savoy Place, London, W.C.2, 6 p.m. Inaugural Address by the President, Mr. J. M. Kennedy.

Oct. 25 (*Fri.*).—Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 6 p.m. Presidential Address by Col. A. E. Davidson, D.S.O., A.D.C.

XUM

LEGAL AND OFFICIAL NOTICES

In the Court of the Railway Rates Tribunal

Road and Rail Traffic Act, 1933. Agreed Charges.

NOTICE IS HEREBY GIVEN that Applications for the approval of Agreed Charges under the provisions of Section 37 of the Road and Rail Traffic Act, 1933, short particulars of which are set out in the Schedule hereto, have been lodged with the Railway Rates Tribunal.

The said Applications may be inspected at the Office of the Tribunal, Bush House, Aldwych, London, W.C.2, at any time during office hours and at the following places:—

LONDON: Railway Clearing House, 123, Seymour Street, N.W.1.
BIRMINGHAM: District Goods Manager's Office, Snow Hill, Great Western Railway.
CARDIFF: Divisional Superintendent's Office, Great Western Railway.
EXETER: Western Divisional Superintendent's Office, Southern Railway.
LEEDS: District Goods Manager's Office, Wellington Street, London & North Eastern Railway.
LEICESTER: District Goods and Passenger Manager's Office, London Midland & Scottish Railway.
MANCHESTER: District Goods Manager's Office, Hunt's Bank, London Midland & Scottish Railway.
SOUTHAMPTON: Southern Divisional Superintendent's Office, Southampton West, Southern Railway.
YORK: Goods Manager's Office, London & North Eastern Railway.
ABERDEEN: District Goods and Passenger Manager's Office, London Midland & Scottish Railway.
EDINBURGH: District Goods and Passenger Manager's Office, Waverley Station, London & North Eastern Railway.
GLASGOW: Commercial Manager's Office, Central Station, London Midland & Scottish Railway.

A copy of each Application lodged with the Tribunal can be obtained from Mr. G. Cole Deacon, Secretary, Rates and Charges Committee, 35, Parliament Street, Westminster, London, S.W.1, price 1s., post free.

Notices of objection by any parties entitled to object to the approval of any of the said Agreed Charges must state concisely the grounds of objection and must be filed at the office of the Registrar, Bush House, Aldwych, London, W.C.2, on or before the 29th day of October, 1935, and a copy thereof on or before the same day served on or sent by registered post to Mr. G. Cole Deacon, at the above address. A separate Notice must be filed and served in respect of each Application.

Each Notice filed must be on foolscap size paper and must be stamped with an adhesive fee stamp for 2s. 6d. (which can be purchased at the office of the Tribunal only). If sent by post for filing, each Notice must be accompanied by a Postal Order for 2s. 6d. payable to the Registrar, when a stamp will be affixed at the office. A Notice by a Representative Body of Traders must contain a statement of the facts upon which such Body claims to represent a substantial number of traders interested in, or likely to be affected by the decision on, the application.

Four additional copies of each Notice must be lodged with the original at the office of the Registrar.

T. J. D. ATKINSON,
Registrar.

4th October, 1935.

Number of Application and Date of Lodgment	Parties to Agreement	Nature of Agreed Charge
1935. No. 275—Oct. 1, 1935	CAPSEALS LIMITED, Trading Estate, Slough, and the G.W. Railway Co.	Per ton. Cardboard Containers, such as used for Cream; Cardboard Discs.
1935. No. 276—Oct. 1, 1935	DYSON & HORSFALL LIMITED, Aqueduct Mills, Preston, and the L.M. & S. Railway Co.	Per ton. Clothing, Drapery and General Stores Wares.
1935. No. 277—Oct. 1, 1935	THE FORE STREET WAREHOUSE CO. LTD., 104, Fore Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S., and Southern Railway Cos.	Per ton. Clothing, Drapery, Haberdashery, Millinery; Earthenware, Fancy Goods; Glass Cabinets; Wooden Stands; Empties returned to Suppliers.
1935. No. 278—Oct. 1, 1935	GRAINGER & SMITH LIMITED, Dudley, and the G.W. and L.M. & S. Railway Cos. *Applicable also to traffic consigned by one Associated or Subsidiary Company.*	Per ton. Clothing, Drapery, Woollen Goods, and Empties returned to Suppliers.
1935. No. 279—Oct. 1, 1935	THE ORIENTAL FIBRE MAT AND MATTING COMPANY, Vonda Works, Highworth, Wilts, and the G.W. Railway Co.	Per ton. Carpeting, Rugs, Mats, Matting and Oilcloth.
1935. No. 280—Oct. 1, 1935	R. ROWLEY & CO. LTD., Queen Street, Leicester, and the L. & N.E. and L.M. & S. Railway Cos.	Per ton. Hosiery.
1935. No. 281—Oct. 1, 1935	THE SOUTH WALES SACK AND BAG CO. LTD., Dumballs Road, Cardiff, and the G.W. and L.M. & S. Railway Cos.	Per ton. Sacks and Sacking, not new.
1935. No. 282—Oct. 1, 1935	THE WELSH TINPLATE & METAL STAMPING CO. LTD., Llanelly, and the G.W. Railway Co.	Per ton. Enamelled Ware; Tinware; Empties returned to Suppliers.
1935. No. 283—Oct. 1, 1935	BALLINGTON HOSIERY LIMITED, Ballito Hosiery Mills, Hatfield Road, St. Albans, and the L. & N.E. and L. M. & S. Railway Cos.	Per package. Hosiery and Advertising Matter.
1935. No. 284—Oct. 1, 1935	THE FORE STREET WAREHOUSE CO. LTD., 104, Fore Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Drapery, Underwear and Millinery.
1935. No. 285—Oct. 1, 1935	PARAMOUNT BETTING SYNDICATE LIMITED, Ring Road, Wortley, Leeds, and the L. & N.E. and L.M. & S. Railway Cos. *Applicable also to traffic consigned by one Associated or Subsidiary Company.*	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 286—Oct. 1, 1935	M. & J. TOEMAN LIMITED, National House, 3, Wood Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Hosiery.
1935. No. 287—Oct. 1, 1935	THE CITY AND PROVINCIAL STORES, Atlantic Mills, Manchester, and the Cheshire Lines Committee and the G.W., L. & N.E. and L.M. & S. Railway Cos.	Per package. Furniture and Household Requisites.
1935. No. 288—Oct. 1, 1935	CLEEVES LIMITED, Cleevedale Park, Clapham, London, S.W.4, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Confectionery.
1935. No. 289—Oct. 1, 1935	PIRIE APPLETON & CO. LTD., Aldgate House, 46-58, Mansell Street, London, E.1, and the L. & N.E. and L.M. & S. Railway Cos.	Per ton. Paper and Stationery; Empties returned to Suppliers.
1935. No. 290—Oct. 1, 1935	SELFRIDGE & CO. LTD., Oxford Street, London, W.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per ton. Clothing, Drapery and General Stores Wares.
1935. No. 291—Oct. 1, 1935	TAYLOR, LAW & CO. LTD., Tala Works, Adams Street, Birmingham, and the G.W. and L.M. & S. Railway Cos.	Per ton. Tinware and Hardware.
1935. No. 292—Oct. 1, 1935	THE CITY AND PROVINCIAL STORES, Atlantic Mills, Manchester, and the Cheshire Lines Committee, and the G.W., L. & N.E., and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 293—Oct. 1, 1935	THE DUCHESS OF DEVONSHIRE DAIRY CO. LTD., Tiverton, Devon, and the G.W. Railway Co.	Per ton. Butter, Cream, Eggs, Cheese, Honey, Paste and Advertising Matter.
1935. No. 294—Oct. 1, 1935	HORNE BROS. LTD., 90 and 92, Oxford Street, London, W.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Boots, Clothing, Hats, Hosiery and Shirts.
1935. No. 295—Oct. 1, 1935	R. J. & A. R. PITCHERS LIMITED, Rock Place, Godalming, and the Southern Railway Co.	Per package. Woollen Goods.
1935. No. 296—Oct. 1, 1935	THE SOUTH WESTERN DAIRIES LIMITED, Sherborne, Dorset, and the G.W. and Southern Railway Cos.	Per ton. Butter, Cheese, Cream and Honey.
1935. No. 297—Oct. 1, 1935	MUNDUS AND J. & J. KOHN LIMITED, 50, Great Eastern Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos. *Applicable also to traffic consigned by one Associated or Subsidiary Company.*	Per ton. Bentwood Chairs.
1935. No. 298—Oct. 1, 1935	GEORGE BRETTLE & CO. LTD., 119, Wood Street, London, E.C.2, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Gloves, Hosiery and Textiles.
1935. No. 299—Oct. 1, 1935	I. & H. CAPLAN LIMITED, 2, 4 and 6, Stanley Street, Sheffield, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 300—Oct. 1, 1935	COHEN & WILKS LIMITED, Aquatite Mills, Derby Street, Cheetham, Manchester, and the Cheshire Lines Committee and the G.W., L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing and Advertising Matter.
1935. No. 301—Oct. 1, 1935	COOP & CO. LTD., Wigan, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing.
1935. No. 302—Oct. 1, 1935	EMPIRE STORES LIMITED, Canal Road, Bradford, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 303—Oct. 1, 1935	EUGENE LIMITED, Edgware Road, Hendon, London, N.W., and the L.M. & S. Railway Co.	Per package. Papier Sachets and small parts of Hair Waving Machines.
1935. No. 304—Oct. 1, 1935	THOS. FATTORINI (SKIPTON) LIMITED, 1-7, Newmarket Street, Skipton, Yorkshire, and the L.M. & S. Railway Co.	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 305—Oct. 1, 1935	A. GOLDENFELD & CO. LTD., 101, High Street, Whitechapel, London, E.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Boots, Shoes, Electric Lamp Bulbs, Haberdashery and Textiles.
1935. No. 306—Oct. 1, 1935	GREENGATE & IRWELL RUBBER CO. LTD., Greengate Works, Manchester, and the Cheshire Lines Committee and the G.W., L. & N.E. and L.M. & S. Railway Cos.	Per package. Waterproof and Showerproof Coats; Light Electric Cable; Rubber Boots and Shoes; Belting—Balata, Rubber, Canvas and Rubber; Rubber Goods; Gaiters, Leggings and Slippers (Felt and/or Leather); Ebonite Sheets and Cylinders.

Legal and Official Notices—*continued*

Number of Application and Date of Lodgment	Parties to Agreement	Nature of Agreed Charge
1935. No. 307—Oct. 1, 1935	SAML. HANSON & SON LTD., 14, Eastcheap, London, E.C.3, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Confectionery, Groceries, Preserves, Advertising Matter and Travellers' Stationery.
1935. No. 308—Oct. 1, 1935	R. & J. HILL LIMITED, Spinet House, 175, Shoreditch, London, E.1, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Cigarettes and Tobacco.
1935. No. 309—Oct. 1, 1935	W. A. HOGG LIMITED, 19, Queen Street, Leeds, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing and Woollen Goods.
1935. No. 310—Oct. 1, 1935	GORDON MACKAY & CO. (LEEDS) LTD., Gomaco House, Armley Road, Leeds, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 311—Oct. 1, 1935	H. PEARSON LIMITED, Old Trafford, Manchester, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Clothing and Drapery.
1935. No. 312—Oct. 1, 1935	SAXONE SHOE CO. LTD., Kilmarnock, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. (i) Boots and Shoes from Kilmarnock. (ii) Boots and Shoes received at Kilmarnock from Trader's Branch Shops.
1935. No. 313—Oct. 1, 1935	S. A. SQUIRRELL & CO., Colton Street, Leicester, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Boots and Shoes.
1935. No. 314—Oct. 1, 1935	STEAD & SIMPSON LIMITED, Belgrave Gate, Leicester, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Boots and Shoes.
1935. No. 315—Oct. 1, 1935	LUKE TURNER & CO. LTD., Deacon Street, Leicester, and the L. & N.E. and L.M. & S. Railway Cos.	Per package. Elastic Webbing.
1935. No. 316—Oct. 1, 1935	W. WILLIAMS & SON (BREAD STREET) LTD., 53 and 54, Bread Street, London, E.C.4, and the G.W., L. & N.E., L.M. & S. and Southern Railway Cos.	Per package. Belts, Braids, Buttons, Fancy Handkerchiefs, Feather Neckwear, Fringes, Furs, Fur Coats, Haberdashery, Knitted Sports Wear, Ladies' Handbags and Trimmings.
1935. No. 317—Oct. 1, 1935	THE WITNEY BLANKET CO. LTD., Buttercross Works, Witney, and the G.W. Railway Co.	Per package. Clothing, Drapery and General Stores Wares.
1935. No. 318—Oct. 1, 1935	CARRICK'S (CATERERS) LIMITED, Low Row, near Carlisle, and the L. & N.E. Railway Co.	Per package. Black Puddings, Cake, Cooked Meats, &c., Cream in bottles, Pies, Polonies and Sausages.

Central Argentine Railway Limited

NOTICE IS HEREBY GIVEN that the Transfer Books of the 5 per cent. Redeemable Debenture Stock, 1967-87, of the Company will be closed on the 10th October, 1935, for one day only for the preparation of Warrants for Interest for the six months ending 31st October, 1935.

F. FIGHIERA,
Secretary.

3A, Coleman Street,
London, E.C.2.
3rd October, 1935.

REQUIRED, for large rolling stock works in India, a WORKS INSPECTOR with similar experience in modern plant fabricating and erecting steel wagons and underframes. Five year agreement, salary according to experience, free unfurnished quarters. Apply by letter, with copies of testimonials, stating age and whether married or single, to "INSPECT," c/o W. ABBOTT LTD., 32, Eastcheap, London, E.C.3.

South Indian Railway Company Limited.

THE Directors are prepared to receive tenders for the supply of :—

1. LOCOMOTIVE BOILER (Y.B. TYPE).
2. DOG SPIKES.

Specifications and forms of tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Company, Limited, marked "Tender for Locomotive Boiler" or as the case may be, with the name of the firm tendering, must be left with the undersigned not later than 12 NOON of Friday the 1st November, 1935, in respect of Specification No. 1, and not later than 12 NOON on Friday, 25th October, 1935, in respect of Specification No. 2.

The Directors do not bind themselves to accept the lowest or any tender.

A charge, which will not be returned, will be made of 10s. for each copy of Specification No. 1, and of 5s. for each copy of Specification No. 2.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, Westminster, S.W.1.

E. A. S. BELL,
Managing Director.

91, Petty France,
Westminster, S.W.1.
9th October, 1935.

Crown Agents for the Colonies

COLONIAL GOVERNMENT APPOINTMENTS

APPLICATIONS from qualified candidates are invited for the following post :—

ASSISTANT WORKS MANAGER

required for the Gold Coast Government Railway for two tours of 12-18 months with possible permanency. Salary £480 a year for the first three years, then £510-30-£720 a year. Free first class passages, quarters and liberal leave in England on full salary. Candidates, age 25-35, must have served a pupilage or apprenticeship with a British Railway or firm of locomotive builders and have had practical experience in all branches of a locomotive works and drawing office.

Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this ... to the Crown Agents for the Colonies, 4 Millbank, London, S.W.1., quoting M/3893.

ENGINEER INSPECTOR required immediately by London firm of consulting engineers for inspection of locomotive contracts on the Continent. Applicants must have served apprenticeship in locomotive works and had at least three years' subsequent experience in manufacture of locomotives and component parts. Previous inspection experience and knowledge of German will be of advantage. Applications giving age and full details of experience to Box No. 7291, c/o BROWN'S, 39, Tothill Street, S.W.1.

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive tenders for :—

800 STEEL TYRES FOR CARRIAGES AND WAGONS.
4,350 DRAWBARS.

Specifications and forms of tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Thursday, 10th October, 1935.

A fee of 10s. will be charged for each copy of the specification, which is NOT returnable.

Tenders must be submitted not later than NOON on Wednesday, 23rd October, 1935.

The Directors do not bind themselves to accept the lowest or any tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board.
T. R. WYNNE,
Managing Director.

RAILWAY AND OTHER REPORTS

Bengal Dooars Railway.—The directors will recommend at the general meeting on November 12, 1935, the payment of a final dividend of 4 per cent. on the ordinary stock, subject to income tax, making a total distribution of 7 per cent. for the year ended March 31, 1935.

Metropolitan Assented Stock.—Glyn, Mills & Co., the trustees and registrar under the trust deed relating to the Metropolitan Assented Stock constituted by the London Passenger Transport Act, 1933, announce that a final interest payment at the rate of 2¼ per cent., less tax, making, together with the interim payment of 1 per cent., the full interest rate of 3¼ per cent. for the year ended June 30, 1935, will be made to holders registered on October 9. Warrants will be posted on October 23.

Ransome & Marles Bearing Co. Ltd.—A dividend of 10 per cent. is recommended for the year ended June 30 (against 7½ per cent. for 1933-34). The accounts will be posted on October 4.

South Indian Railway.—The directors have decided to recommend that a final dividend for the year 1935 of 1½ per cent., less income tax, be made from surplus profits on January 1, 1936, making with the guaranteed interest of 1¾ per cent. payable on the same date, a total payment of 3¼ per cent., less income tax, for the half year ending December 31, 1935, and together with the payment that was made on July 1, 1935 (namely, 3¼ per cent.), a total payment of 6½ per cent. for the year.

Stothert & Pitt Limited.—The directors propose to pay the dividend on the preference shares for the three years ended June 30, 1935.

Hurst, Nelson & Co. Ltd.—A trading loss was sustained for the year ended July 13 last, but after crediting investment income and meeting directors' fees and depreciation, there is a net profit of £22,372, compared with £21,767 for 1933-34. Adding £4,266 gives a total of £26,638 available. Provision for preference dividends takes £9,300, and it is proposed to pay on November 11 a dividend (less tax) of 9d. on each ordinary £1 share, which will absorb £11,625, leaving £5,713 to be carried forward.

XUM

Railway Share Market

Stock and share markets made a vigorous start to the new Stock Exchange Fortnightly Account, but the uncertainty as to the outcome of economic sanctions against Italy caused quotations to be reactionary. Home railway stocks suffered owing to absence of support on the fall. With the junior stocks marking about 20 to 25 per cent. below the level of a few months ago there was every attraction for bargain-hunters and it can only be assumed that the absence of buyers at what are in many instances the lowest prices of the year is attributable to the international situation.

Traffic receipts have done little to encourage buyers, and whilst the returns issued on Wednesday were moderately satisfactory they do not come up to the hopeful expectations of a few months ago. Southern deferred ordinary made a good recovery, although the better price was not held for long. The Stock Exchange is expecting the result of the rating appeal to be known about the end of the month. If it goes in favour of the railway there is likely to be a big jump in the price of the preferred ordinary stock as the market estimates that it would assure to that stock the payment of the full non-cumulative 5 per cent. to which it is entitled. London Transport "C" stock did not change materially following the declaration of a final dividend of 2½ per cent., making 4 per cent. for the past year. The dividend was mainly in accordance with market estimates and operators are now awaiting the accounts before reaching final judgment as to the prospective value of the stock. In foreign railway stocks Argentine issues have been very weak owing to the unexpected decisions of the B.A. Western and B.A. Great Southern Railways to pay a dividend of only 2½ per cent. on the former company's 4½ per cent. preference stock and only 3 per cent. on the latter's 6 per cent. preference stock, whereas the Stock Exchange was under the confident impression that the full rates would be forthcoming.

The whole market has dropped sharply and B.A. Great Southern 6 per cent. preference was marked down 14½ points. The current quotation is nearly half the buying price of only a fortnight ago. The statement accompanying the announcement did not hold out any prospect of the forthcoming report and accounts coming up to recent Stock Exchange anticipations and the market was very heavy throughout the week.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1934-35	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1934	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1934	Prices: Lowest 1934	Prices: Oct. 9, 1935	Yield % (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili) & Bolivia	830	6.10.35	11,220	— 7,170	40	487,090	570,050	— 82,960	Ord. Stk.	26 3/4	19	18	Nil
	Argentine North Eastern	753	5.10.35	8,813	+ 434	14	118,891	111,007	+ 7,884	,,	11	6 7/8	5 1/2	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	A. Deb.	52	45	48	85 15/16
	Bolivar	174	Sept., 1935	5,000	— 200	39	55,300	54,350	+ 950	6 p.c. Deb.	10	6 1/2	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	13 5/4	10 7/16	13	3 15/16
	Buenos Ayres & Pacific	2,806	5.10.35	74,031	+ 5,628	14	1,008,914	973,827	+ 35,087	Ord. Stk.	16 1/2	8 1/2	6 1/2	Nil
	Buenos Ayres Central	190	28.9.35	$152,000	+ $12,700	13	$1,668,400	$1,732,600	— 864,200	Mt. Deb.	23	10	16	Nil
	Buenos Ayres Gt. Southern	5,085	5.10.35	113,925	+ 1,286	14	1,670,583	1,712,589	— 42,006	Ord. Stk.	35	22	16	Nil
	Buenos Ayres Western	1,930	5.10.35	38,367	+ 333	14	559,610	577,420	— 17,810	,,	27 1/2	18 1/2	12 1/2	Nil
	Central Argentine	3,700	5.10.35	117,729	+ 7,182	14	1,659,906	1,740,282	— 80,376	,,	23	13 1/2	8 1/2	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	14	7	5	Nil
	Cent. Uruguay of M. Video	273	5.10.35	9,651	— 10,440	14	117,022	241,131	— 124,109	Ord. Stk.	15 1/2	3	4	Nil
	Do. Eastern Extn.	311	5.10.35	1,422	— 218	14	18,703	20,812	— 2,109	—	—	—	—	—
	Do. Northern Extn.	185	5.10.35	1,118	+ 156	14	14,712	11,751	+ 2,961	—	—	—	—	—
	Do. Western Extn.	211	5.10.35	875	+ 14	14	10,343	9,341	+ 1,002	—	—	—	—	—
	Cordoba Central	1,218	5.10.35	29,610	+ 3,450	14	450,840	446,570	+ 4,270	Ord. Inc.	6	3	2	Nil
	Costa Rica	188	Aug., 1935	16,672	+ 1,698	9	30,402	33,155	— 2,753	Stk.	30 3/4	23 1/2	34	5 7/8
	Dorada	70	Aug., 1935	12,900	+ 1,600	35	93,300	81,500	+ 11,800	1 Mt. Db.	103	95	102 1/2	5 7/8
	Entre Rios	810	5.10.35	11,710	— 888	14	171,363	157,009	+ 14,354	Ord. Stk.	21 1/2	12	9 1/2	Nil
	Great Western of Brazil	1,082	5.10.35	8,100	— 4,300	40	289,000	310,500	— 21,500	Ord. Sh.	7/8	3/8	3/8	Nil
	International of Cl. Amer.	794	Aug., 1935	$304,341	+ $32,953	35	$3,265,011	$3,360,090	— $95,079	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/-	1/-	1/2	Nil
	La Guaira & Caracas	225 4	Sept., 1935	3,560	+ 515	39	34,985	32,865	+ 2,120	Stk.	12 3/4	7 5/8	8 1/2	Nil
	Leopoldina	1,918	5.10.35	26,410	— 943	40	700,797	886,891	— 186,094	Ord. Stk.	14 5/8	7	3 1/2	Nil
	Mexican	483	30.9.35	$301,500	+ $92,400	13	$3,224,300	$2,853,400	+ $370,900	,,	3 1/4	1 1/2	1/2	Nil
	Midland of Uruguay	319	Sept., 1935	5,195	— 3,107	13	15,846	25,851	— 10,005	,,	1 1/2	1/2	1 1/2	Nil
	Nitrate	401	30.9.35	4,184	+ 2,274	39	110,154	100,883	+ 9,271	Ord. Sh.	32 9/32	51/-	2 5/16	Nil
	Paraguay Central	274	28.9.35	$1,927,000	+ $778,000	13	$25,458,000	$12,958,000	+ $12,500,000	Pr. Li. Stk.	84	67	77 1/2	7 3/4
	Peruvian Corporation	1,059	Sept., 1935	69,275	+ 5,502	13	217,772	186,438	+ 31,334	Pref.	14 1/2	8	9	Nil
	Salvador	100	28.9.35	¢10,179	+ £49	13	¢152,540	¢125,737	+ ¢26,803	Pr. Li. Db.	75	70	65	7 11/16
	San Paulo	153 1/2	29.9.35	28,500	+ 2,100	39	991,792	1,065,098	— 73,306	Ord. Stk.	86	67	45 1/2	5 1/2
	Taltal	164	Sept., 1935	4,305	+ 2,470	13	9,250	6,913	+ 2,337	Ord. Sh.	2 1/8	1 7/16	1 1/2	6 11/16
	United of Havana	1,353	5.10.35	14,913	— 1,302	14	237,016	237,691	— 675	Ord. Stk.	6	2	2	Nil
	Uruguay Northern	73	Sept., 1935	580	— 661	13	1,762	3,312	— 1,550	Deb. Stk.	6 1/4	3	4 1/2	Nil
Canada.	Canadian National	23,714	30.9.35	1,029,206	+ 134,607	39	25,026,035	24,392,541	+ 633,494	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	78 1/4	51 1/2	55 1/2	7 5/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104 1/2	97 1/4	96	4 5/16
	Canadian Pacific	17,224	30.9.35	962,200	+ 276,000	39	18,408,000	18,180,000	+ 228,000	Ord. Stk.	18 5/16	11 1/16	9 1/2	Nil
India.†	Assam Bengal	1,329	20.9.35	33,000	— 4,739	24	551,667	658,173	— 106,506	Ord. Stk.	88 1/2	72	78 1/2	3 15/16
	Barsi Light	202	10.9.35	2,610	— 97	22	64,860	69,667	— 4,807	Ord. Sh.	10 4 1/2	9 8 3/4	8 2 1/2	6 1/16
	Bengal & North Western	2,114	20.9.35	48,970	+ 4,105	24	1,159,801	1,166,783	— 6,982	Ord. Stk.	29 7 1/2	26 2	29 3 1/2	5 7/16
	Bengal Dooars & Extension	161	10.9.35	3,612	— 579	22	55,890	64,381	— 8,491	,,	12 5 1/4	12 4	12 5 1/2	5 9/16
	Bengal-Nagpur	3,268	31.8.35	184,875	+ 37,477	21	2,660,672	2,465,768	+ 194,904	,,	10 5 1/2	9 6	10 1 1/2	3 15/16
	Bombay, Baroda & Cl. India	3,072	30.9.35	201,900	+ 10,575	26	3,804,375	3,850,050	— 45,675	,,	11 5	10 8 1/2	11 2 1/2	5 5/16
	Madras & South'n Mahratta	3,230	10.9.35	120,675	— 25,232	22	2,403,246	2,674,789	— 271,543	,,	13 1	12 2 5/4	12 0 1/2	7 7/8
	Rohilkund & Kumaon	546	20.9.35	9,060	— 1,838	24	221,199	230,318	— 9,119	,,	26 3	25 0	29 2 1/2	5 1/2
	South India	2,526	20.9.35	106,454	— 15,227	24	1,930,472	2,015,226	— 84,754	,,	11 9	11 5	11 6 1/2	6 7/16
Various.	Beira-Umtali	204	July, 1935	64,040	+ 1,806	43	640,305	519,179	+ 121,126	—	—	—	—	—
	Bilbao River & Cantabrian	15	Sept., 1935	1,160	— 695	39	13,358	16,195	— 2,837	—	—	—	—	—
	Egyptian Delta	622	10.9.35	6,124	— 828	22	88,869	90,862	— 1,993	Prf. Sh.	21 3/16	13 4	15 4	5 11/16
	Great Southern of Spain	104	28.9.35	2,419	— 1,576	39	69,543	85,384	— 15,841	Inc. Deb.	4	3 1/2	3 1/2	Nil
	Kenya & Uganda	1,625	Aug., 1935	168,664	+ 8,252	35	1,642,084	1,545,502	+ 96,582	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50	33	39	9
	Mashonaland	913	July, 1935	111,714	— 4,769	43	1,159,674	956,615	+ 203,059	1 Mg. Db.	101	91 3/4	101 1/2	4 15/16
	Midland of W. Australia	277	Aug., 1935	12,044	— 2,011	9	23,052	25,952	— 2,900	Inc. Deb.	100	93	94 1/2	5 5/16
	Nigerian	1,905	17.8.35	17,280	— 2,490	20	472,374	519,306	— 46,932	—	—	—	—	—
	Rhodesia	1,538	July, 1935	199,144	+ 6,699	43	1,922,663	1,611,125	+ 311,538	4 p.c. Db.	104 7/8	97 1/2	104	3 15/16
	South African	13,225	14.9.35	571,785	+ 43,412	24	13,110,820	11,910,565	+ 1,200,255	—	—	—	—	—
	Victorian	4,728	June, 1935	686,838	— 6,716	52	9,421,092	9,175,111	+ 245,981	—	—	—	—	—
	Zafra & Huelva	112	Aug., 1935	12,102	+ 955	35	88,575	88,009	+ 566	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being over estimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value